The long-run share price performance resulting from Mergers & Acquisitions in South Africa: A Calendar-Time Approach.

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Abstract

With increasing globalisation and the need to expand into new markets quickly and efficiently, South African firms are more than ever relying on mergers and acquisitions (M&A). It is therefore important to revisit the debate on whether M&A is a beneficial long-term corporate strategy for shareholders, especially given that little South African literature exists on this issue. This study addresses this question by examining both the short- and long-run share return performances resulting from 204 mergers and acquisitions (M&A) over the period 2003-2014, involving companies listed on the Johannesburg Stock Exchange (JSE) as acquirers.

The measurement of long-run performance of M&A and other corporate events such as share buy backs and seasoned offerings remains contentious primarily due to concerns on the appropriate benchmarks for abnormal share return performance as a result of these events and the methodology used to measure long-run realized returns from these events. With regard to benchmarks, a combination of four return factors deemed appropriate for the South African equity market is used to benchmark the abnormal returns related to M&A activities. These factors are the JSE's Financial & Industrials Index (JSE index code J213 or colloquially known as the Findi), the JSE's Resources Index (JSE index code J210 or colloquially known as the Resi), and the size and book-to-market factors. Two methods have been widely used to determine the long-run share return performance from corporate events: The Buy-and-Hold Abnormal Return (BHAR) approach and the more statistically robust Calendar Time Portfolio (CTP) approach. Using these two approaches, this study finds that, in the long term, there are no statistically significant abnormal returns associated with merger and acquisition transactions for the sample of South African acquirers tested.

The correlation of a number of key transaction attributes with long-run M&A related share return performance is also examined in this study. The following characteristics are thus tested: the method of payment (cash, equity or cash and equity), the listing status of acquisition targets (private, public or subsidiary), the target's geographical location (cross-border or non-cross border, i.e. South African), the relatedness of the target's industry to

the acquirer's (i.e. conglomerate versus horizontal M&A) and the percentage of the target acquired (50% or more and less than 50%). The results indicate that cash acquirers outperform both equity and cash and equity acquirers, acquirers of subsidiaries outperform acquirers of private or public targets, cross-border acquirers outperform non cross-border acquirers, conglomerate M&A underperform horizontal or related M&A and gaining control, i.e. acquiring 50% or more of the target results in slightly higher return than not gaining control.

In addition, the short-run share return performance of M&A is examined to investigate whether investors' short-run expectations from M&A announcements manifest in the long-run. The findings indicate that a positive abnormal short-run return is on average achieved in the -5, 5 event window. However, the market corrects for this initial positive reaction to M&A announcements, as the positive return becomes insignificant within 10 days of the announcement.

The results of this study indicate that South African companies' merger and acquisition activities do not deliver any statistically significant short- or long-term value to shareholders, implying that great care should be taken when considering such actions.

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Chapter 1: Introduction

1.1. Background

During the course of 2017, global mergers and acquisitions (M&A) activity exceeded $3 trillion for the fourth consecutive year (Massoudi, Fontanella-Khan and Weinland, 2017). While the South African M&A market has not recovered to its heights prior to the 2008 financial crisis, the country's M&A market has experienced upward momentum since 2008, with a record-breaking R1.5 trillion in total value in 2016, largely due to the R1.24 trillion AB InBev/SAB merger. As a result, M&A related issues continue to draw considerable interest from academics, both internationally and locally.

A much-debated question relating to M&A is whether it delivers positive returns to the shareholders of acquirers. For many years, short-term event studies dominated the academic literature concerning returns to these shareholders. The conventional belief was that the short-term stock price reaction around M&A announcement dates fully incorporates the information effects of M&A. However, recent event studies measuring long-term[1] returns to shareholders of acquirers over the three to five years following the completion of M&A have cast doubt on the interpretation of findings from short-term event studies. These studies suggest that in the short-term, investors fail to accurately assess the full impact of M&A announcements. Although long-term studies vary greatly in design, datasets and timeframes, the overall picture indicates long-term post-merger underperformance of acquirers and negative return to their shareholders (Mager & Meyer-Fackler, 2017).

The practical motivation for this study is revealed through the paradox posed by Brouthers, Van Hastenburg and Van Den Ven (1998): If the empirical evidence suggests that M&A fail in the long-run, why do they remain a popular expansion strategy for companies? One of the main reasons brought forward to explain this paradox, which is also the focus of this study, is that of statistical malfeasance, particularly the methods

[1] Long-term refers to several months or years after the effective date of the event. This study conceptualizes long-term as 1-3 years.

used to measure post M&A performance. In contrast to event studies over short horizons, long-term event studies are sensitive to the methods used for computing returns, as some commonly used methods are severely flawed (Mitchell & Stafford, 2000; Fama, 1998). Two broad measures have been used to evaluate post- M&A corporate performance: accounting measures based on financial ratios and share price returns that are related to the capital market (Ramakrishnan, 2008).

With regard to share price returns, two methods have been widely used in literature to measure the long-term post-event performance: The Buy-And-Hold Abnormal Return (BHAR) and the Calendar-Time Portfolio (CTP) approach, also known as the Jensen-alpha approach (Khotari & Warner, 2005). This study briefly examines the short-run share return performance of acquirers, before turning its attention to the long-run post-acquisition share return performance of listed South African acquirers. For the long-run performance, this study employs both the BHAR and CTP approaches to ensure that results relating to long-term abnormal returns are consistent and robust across different methodological choices.

1.2. Research problem

Despite most empirical evidence pointing towards underperformance of acquirers following M&As, studies on the long-term post-merger performance of acquiring firms, in both developed and developing countries, have failed to come to a convincing and definitive conclusion on overall long-term acquirer performance and whether M&A create or destroy shareholder value. In South Africa, the bulk of the empirical research suggests that M&A do not create any meaningful value for shareholders of acquirers (Wimberley & Negash, 2004). In spite of this evidence, M&A remain a popular corporate strategy for South African firms.

The popularity and resilience of M&A, despite of their failure to create value for shareholders, should not be surprising. Some of the reasons firms engage in M&A, particularly the rapidly changing market conditions, increased globalisation and the need to expand into new markets quickly and efficiently can only be expected to intensify. M&A

can therefore be expected to increase as firms try to cope with an increasingly challenging business climate. Given this anticipated increase in M&A, it is important to understand whether M&A are creating or destroying shareholders' value, because only value-creation can justify the continued use of M&A as a corporate strategy by South African firms. Therefore, the research question is, "Do M&A active companies outperform their non-active counterparts in the South African context?"

1.3. Contributions to literature

This study contributes to the literature in two main ways. Firstly, in addition to informing the debate on both short and long-term performance of M&A as measured in terms of share returns, this study pays considerable attention to the choice of methodology, particularly for the long-term perspective. Two methods have been widely used in literature to measure the long-term post-event performance of M&A, namely the BHAR and the CTP (Khotari & Warner, 2005). While Barber and Lyon (1997) advocate for the BHAR approach, other researchers such as Fama (1998) and Mitchell and Stafford (2000) recommend the CTP approach, primarily because unlike the BHAR approach, it corrects for positive cross-correlation in returns of acquiring firms. As previously stated, this study uses both the BHAR and CTP approaches to ensure that its findings on long-term abnormal returns are robust across different methodological choices. However, the study puts more weight on the findings of the more statistically sound CTP approach. Furthermore, this study is the first to examine long-term post-merger performance in emerging markets, particularly South Africa, using the CTP approach.

Secondly, in addition to examining the long-run performance of acquirers, this study also examines potential M&A transaction-related characteristics that could be correlated with long-term share return performance, to get a better understanding of the possible sources of value-creation or destruction arising from South African M&A. Examining these determinants will enhance the plausibility and understanding of the long-run post-merger performance of South African acquirers. This study is the first to comprehensively examine the possible determinants of value-creation or destruction from South African M&A.

1.4. Research questions

The research questions examined in this study fit into three broad categories. Firstly, how do South African acquirers perform in the short-run, as measured by their total share excess returns? This question is only briefly examined in this paper as a baseline in order to establish the market's immediate reactions to merger announcements, but as this topic has been examined before in the South African context[2], it is not the core focus of this study. However, South African M&A performance from a long-term perspective remains largely unexplored. Consequentially, the main focus of this paper is the long-term total share return to acquirers. Therefore, the second research question is: how do South African acquirers' share prices perform in the long-run? While short-term studies measure investors' expectations, long-run studies examine the impact M&A have on the long-term performance of acquirers. Only positive excess performance by acquirers (*i.e.* share return performance higher than would have been expected to be the case without acquisitions) can justify the continued use of M&A as a corporate strategy. By examining both short and long-term returns, the study implicitly investigates whether investors' short-run assessments of M&A manifest in the long-run. The third research question that is investigated in this study is whether there are any transaction specific attributes that are correlated with the long-term excess returns (if any) of the acquiring companies – in other words, are there any transaction-specific elements that possibly have predictive value in explaining the long-run performance of acquirers? These three categories will be used as sub-sections for the literature review and methodology and results sections.

1.5. Thesis structure

The remainder of this document is document is structured as follows. Chapter 2 examines the theoretical basis and literature of this study. This chapter focuses mainly on M&A theory and event studies, which are the core methodology used in this study. Chapter 3 discusses the relevant empirical literature and its findings, and is followed by Chapter 4, which describes the sample selection and data used in this study. Chapter 5 describes and analyses the methodology used and the findings of the study, and Chapter 6 concludes.

[2] See Mushidzhi and Ward (2004), Smit and Ward (2007) and Ndlovu (2017).

Chapter 2: Theoretical framework

M&A refer to corporate actions that involve purchasing and or joining with other companies (Ramakrishnan, 2008). A merger refers to the consolidation of two or more companies into one, while an acquisition refers to the takeover of one entity by another (Ramakrishnan, 2008). There are four types of M&A: horizontal M&A (M&A within the same industry); vertical M&A (M&A within the same industry but at different points in the supply chain); congeneric M&A (M&A between companies in related industries with different products) and conglomerate M&A (M&A between companies in unrelated industries with very little in common) (Dalkılıç & Cagle, 2015).

The theoretical reasons that drive M&A can be divided into three broad categories: economic, strategic and personal reasons. Economic motives have the explicit goal of creating value for shareholders by releasing synergies from increasing revenue and profits, cutting costs and economies of scale. Strategic motives, on the other hand, aim to achieve long-term growth by improving the strategic positioning of the firm through global expansion, pursuing market power, acquisition of new resources (including managerial skills and raw materials) and improving the competitive environment by acquiring a competitor or creating barriers to entry and product line extensions (Brouthers, van Hastenburg & van den Ven, 1998). Personal motives include enhancement of managerial prestige through increased sales and firm growth and increased remuneration through increased sales or profitability (Brouthers, van Hastenburg & van den Ven, 1998).

Regardless of the motive, M&A are expected to impact the acquirer's performance in terms of profitability, shareholder wealth, research and development, resource redeployment, management effectiveness, and a variety of other value creation indicators (Dobreva & Kwenda, 2017). The impact of M&A on shareholder wealth has been the most empirically examined indicator of value creation through two primary means: accounting measures based on objective data, such as cash flow returns and other financial ratios, and share price returns, again based on objective data that are related to the capital market (Ramakrishnan, 2008). In this study, the focus is on share price returns examined primarily from a long-term perspective, and briefly from a short-term perspective.

2.1 Event studies

This section begins by discussing the measurement of long-term performance. At the core of this discussion are the methodologies used for measurement of returns and the benchmarks for expected return used in long-term event studies. The use of different methodologies and benchmarks for expected returns could potentially explain the inconsistent findings of the long-run performance from M&A found in the literature. Event studies examine the impact of corporate events such as M&A, share buy backs and stock splits on share prices of participating firms. For each sample security i, the return on the security for time period t relative to the event, R_{it}, is:

$$R_{it} = K_{it} + e_{it} \qquad (1)$$

Where: K_{it} is the normal or expected return in the absence of the event and e_{it} is the excess or abnormal return as a result of the event and indicates the change in shareholder wealth as a result of the event.

Abnormal returns are a crucial measure of long-term performance of corporate events such as M&A, seasoned equity offerings, IPOs and share repurchases. The abnormal return of a firm that underwent an event can be defined as the difference between realized return and the expected or normal return in the absence of the event.

With regard to measurement of post-event realised returns in long-term studies, two approaches have been widely used in literature: the event-time method using the Buy-and-Hold Abnormal Return (BHAR) and the Calendar-Time Portfolio (CTP) approach, also known as the Jensen-alpha approach (Khotari & Warner, 2005). While two main methods have been utilized to measure realized returns, normal returns are estimated in a variety of ways such as the return on a market index i.e. a market return model, using the Capital Asset Pricing Model (CAPM) or a multi-factor model such as the three-factor model developed by Fama and French (1993) and the Carhart four-factor model developed by Carhart (1997). The study discusses the measurement of post-event realised returns first and then turns its attention to normal return models.

2.1.1 Measurement of realized returns

Beginning with Fama *et al.* (1969), the convention in literature was to estimate long-term abnormal results by summing daily or monthly average abnormal returns over time i.e. the Cumulative Average Abnormal Return (CAAR) approach. However, Barber and Lyon (1997) argue that Cumulative Average Abnormal Returns (CAARs) have two biases: the new listing bias and measurement bias.

The measurement bias arises because the CAAR approach ignores compounding of returns (Barber & Lyon, 1997). Since the CAAR approach ignores the compounding effect in returns, it does not accurately measure the return to an investor who holds a security for a long period after the event (Fama, 1998). Regarding the new listing bias, long-term event studies require researchers to identify an initial event month for each event firm in their sample. However, because many new firms begin trading after this initial month and form part of the market index against which sample firms' performance is benchmarked, Barber and Lyon (1997) anticipate that over long-term periods, the population mean for CAARs would be positively biased. Barber and Lyon (1997) refer to this as the new listing bias and because of these two biases, they advocate for the BHAR approach.

Mitchell and Stafford (2000) describe BHAR as "the average multi-year return from a strategy of investing in all firms that complete an event and selling at the end of a pre-specified holding period versus a comparable strategy using otherwise similar non-event firms." Put simply, the BHAR approach estimates abnormal return as the difference between the long-run compounded buy-and-hold return of a sample firm less the long-run compounded return of an appropriate benchmark. Barber and Lyon (1997) suggest three return benchmarks for expected return: a reference portfolio such as the market index, a control firm benchmark, where sample firms are matched to a similar firm on the basis of specified firm characteristics such as size and book-to-market, and an asset pricing benchmark such as the Fama and French three-factor model.

Whilst the BHAR approach is a significant improvement over the CAAR approach since it considers the effect of compounding on event study returns and therefore precisely

measures investor experience, it is not without criticism. Mitchell and Stafford (2000) criticize the BHAR approach for three main reasons. Firstly, the buy-and-hold experience is only one investor experience and there are other investing strategies that capture investors' experiences, such as periodic portfolio rebalancing (Mitchell & Stafford, 2000). Secondly, as a consequence of the compounding effect, BHARs increase with an increase in the holding period. For instance, if abnormal performance exists for only the first six months following an event and three and five-year BHARs are calculated, both can be significant, due to the compounding of the six-month abnormal return. Furthermore, due to compounding, the five-year BHAR will be larger in magnitude than the three-year BHAR. Thirdly, and most importantly, the BHAR is hampered by serious statistical problems that cannot be easily corrected (Mitchell & Stafford, 2000).

The statistical shortcomings of the BHAR approach have been summarized by Khotari and Warner (2005). Firstly, the volatility of the event firm returns exceeds that of matched firms because of event-induced volatility. Secondly, long-run BHARs depart from the normality assumption that underlies many statistical tests, primarily due to a skewness. As an example, Fama (1998) finds that returns from an asset pricing benchmark, tend to be right skewed. Barber and Lyon (1997) shed more light on the skewness bias by suggesting that while it is common to observe a sample firm with an annual return in excess of 100%, it is uncommon to observe a return on the market index in excess of 100%. Since abnormal returns are calculated as the difference between the sample firm return and the market return, abnormal returns are positively skewed.

Thirdly, long-run returns are cross-correlated because many event firms are drawn from a few industries and corporate events such as M&A typically occur in waves. Mitchell & Stafford (2000) suggest that the cross-correlation in returns arising from overlapping cases of event firms results in skewed returns. Lyon, Barber and Tsai (1999) use Microsoft's common stock split in April 1990, June 1991, and June 1992 as an example of overlapping cases. Clearly, the three- or five-year returns calculated relative to each of these event months are not independent because these returns share several months of overlapping returns (Lyon, Barber & Tsai, 1999). Due to this cross-correlation, BHAR

returns are not independent and the Central Limit Theorem (CLM) which states that a large number of independent random variables have a normal distribution does not hold (Mitchell & Stafford, 2000). Both Fama (1998) and Mitchell and Stafford (2000) suggest that if the test statistic in an event study is calculated ignoring cross-dependence in data, it is likely be overstated.

Although Barber and Lyon (1997) support the use of the BHAR approach, the authors found that using a reference portfolio such as the market index as a benchmark yields three biases: the new listing bias, the rebalancing bias and the skewness bias. The new listing bias arises as a mismatch between sample firms that have long post-merger returns and newly listed firms in the reference portfolio that began trading subsequent to the event month, the rebalancing bias arises since the compounded returns of a reference portfolio are typically calculated assuming periodic rebalancing while the returns of sample firms are compounded without rebalancing and the skewness bias arises because long-run abnormal returns are skewed to the right (Barber & Lyon, 1997).

To mitigate biases from the reference portfolio approach, Barber and Lyon (1997) suggest the use of the control firm approach, which matches sample firms to control firms of similar size and book-to-market value. The control firm approach yielded well-specified test statistics as they eliminated the biases from the reference portfolio approach. This approach eliminates new listing bias (since both the sample and control firms must be listed in the event month), the rebalancing bias (since both the sample and control firms' returns are calculated without rebalancing) and the skewness bias (since both the sample and control firms are equally likely to have large positive returns) (Barber & Lyon, 1997). However, Khotari and Warner (2005) argue that long-horizon buy-and-hold returns tend to be right skewed even after adjusting for the performance of a matched control firm since the lower bound for returns is -100% yet returns are unbounded on the upside.

In attempt to redeem the BHAR approach, Khotari and Warner (2005) suggest that the skewness bias reduces with sample size and since long-term event studies typically use large samples, the extent of the skewness bias is mitigated by the larger sample sizes

used in long-run studies. This implies that returns from the BHAR approach are independent and can be used for econometric inference. However, the lack of independence arising from cross-correlation that results in skewed returns remains a challenge. Both Lyon, Barber and Tsai (1999) and Mitchell and Stafford (2000) develop bootstrapped adjusted t-statistics that account for cross-correlation. However, one simple solution for cross-correlation, that is strongly advocated for by Fama (1998) and Mitchell and Stafford (2000) is the CTP approach.

Under the CTP approach, the performance of an event portfolio is tracked in calendar time relative to either an explicit asset-pricing model or reference portfolios. By forming event portfolios and estimating a time-series of portfolio return, the cross-sectional correlations of the individual event firm returns are automatically accounted for in the portfolio variance at each point in calendar time (Mitchell & Stafford, 2000), a significant improvement over the traditional BHAR model. Due to the absence of cross-sectional correlations of the individual event firm returns, the abnormal returns are also normally distributed under the CTP approach which allows for statistical inference (Mitchell & Stafford, 2000).

Mandelker (1974) introduced the CTP approach to financial economics. Under the CTP approach, two variations exist. In the first variation, the performance of a portfolio of event firms is tracked in calendar-time relative to an explicit asset-pricing model (Mitchell & Stafford, 2000). The second variation is the Monthly Calendar-Time Abnormal Returns (MCTAR) used by authors such as Mandelker (1974), Lyon, Barber and Tsai (1999) and Andre, Kooli and L'Her (2004). Under this variation, for each calendar month, the abnormal return is calculated for each security using the returns on reference portfolios such as size and book-to-market portfolios used by Lyon, Barber and Tsai (1999) and Andre, Kooli and L'Her (2004).

The CTP approach was criticized by Loughran and Ritter (2000) who claimed that since the CTP weights each time period equally, it has lower power to detect abnormal performance. Any differential abnormal performance in periods of high activity versus

periods of low activity will be averaged out by the regression approach making the CTP approach less likely to uncover abnormal performance (Loughran & Ritter, 2000). To address this flaw, calendar months can be weighting depending on the sample size of each monthly portfolio. Furthermore, Mitchell and Stafford (2000) found that the CTP approach has more power to detect for abnormal returns than the BHAR approach after accounting for cross-sectional dependence of individual-firm abnormal returns.

Further criticism of the CTP approach comes from Lyon, Barber and Tsai (1999). The potential for model misspecification leads their criticism of the CTP approach. Lyon, Barber and Tsai (1999) state that although the CTP approach controls well for cross-sectional dependence, it remains sensitive to the bad model problem. According to Fama (1998), bad-model problems are of two types. Firstly, any asset pricing model such as the CAPM is simply a model and therefore does not completely describe expected returns (Fama, 1998). Secondly, Fama (1998) argues that even if there were a true model for expected returns, any sample period produces systematic deviations from the model's predictions i.e. sample-specific patterns in average returns that are due to chance, resulting in a false anomaly. As a solution, Fama (1998) suggests the use of firm-specific models for expected return. The bad model problem is more significant using the BHAR approach because returns from the model are compounded (Fama, 1998). In conclusion of their paper, similar to Fama (1998), Mitchell and Stafford (2000) advocate for the use of the CTP approach as it has less statistical flaws than the BHAR approach.

In contrast to the CAAR, BHAR and CTP approaches that use stock price movements to determine economic gains from M&A, researchers such as Healy, Palepu and Ruback (1992) use accounting data such as cash flows and other financial ratios. Their preference for accounting data is primarily motivated by capital market inefficiencies. However, Healy, Palepu and Ruback (1992) acknowledge that accounting data measures are imperfect since they are susceptible to managerial decisions.

Parallel to the smaller body of work on long-term event studies, the bulk of empirical research involving event studies has mainly focused on short-term returns. The

underlying assumption in short-term event studies is that any lag in the response of stock prices to an event is short-lived, i.e. that markets are efficient (Fama, 1998). The Efficient Markets Hypothesis (EMH) states that stock prices reflect all available information and generation of abnormal returns is therefore impossible. According to Fama (1970), markets exhibit one of three forms of efficiency: weak form efficiency, which states that previous share prices cannot be used for prediction of future share prices, semi-strong efficiency, which implies that share prices efficiently adjust to all publicly available information and strong form efficiency, which suggests that all available information, including private information, is included in share prices.

However, the growing body of long-term literature challenges this EMH assumption and argues that stock prices adjust slowly to corporate events (Fama, 1998). In the words of Brav (2000), recent studies in finance document long-run abnormal price reactions subsequent to numerous corporate activities. Evidence of long-run abnormal returns strongly rejects the notion of stock market efficiency.

Still, Fama (1998) questions the existence of any reliable abnormal returns. Fama (1998) argues that many of the long-run anomalies that have been discovered in event studies are not robust across different methodologies. These anomalies include the size effect of Banz (1981), who found an inverse relationship between stock returns and firm size. Further evidence of anomalies is presented by Rosenberg, Reid and Lanstein (1985) who found that prices on the NYSE are inefficient, since average returns on U.S. stocks are positively related to the ratio of a firm's book value of common equity to its market value (i.e. the book-to-market anomaly), while Carhart (1997) found a momentum anomaly.

These anomalies, however, suffer from the joint-test problem: tests of whether abnormal returns are zero are also tests of whether the assumed model of expected or normal returns (*i.e.* the CAPM, market model, etc.) is correct (Khotari & Warner, 2005). Because asset pricing models have little empirical support, there is no consensus on how to measure long-term abnormal returns (Loughran & Ritter, 2000). Furthermore, Fama (1998) suggests that the bad model problem can present false anomalies. The bad-model

problem states that any asset pricing model, such as the CAPM, is just a model and therefore does not completely describe expected or normal returns, and that, even if a true model existed, any sample period produces systematic deviations from the model's predictions that are due to chance, resulting in a false anomaly (Fama, 1998).

Loughran and Ritter (2000) argue that researchers must choose between normative models such as the CAPM or positive models that control for variables such size and book-to-market. The difference between the two models is that tests of market efficiency require that a normative model be used as a benchmark whereas if a positive (empirically based) model is used, one is not testing market efficiency but rather whether any patterns that exist are being captured by other known patterns (Loughran & Ritter, 2000). As previously acknowledged, this study does not concern itself with market efficiency and will therefore be using a positive model.

2.1.2 Normal return models

A variety of models have been used to estimate normal or expected returns that serve as a benchmark for abnormal returns. This section begins with a discussion of international normal return models and then South African normal return models.

2.1.2.1 International normal return models

Beginning with the CAPM of Sharpe (1963), the model measures portfolio performance relative to the general market portfolio. In its essence, the CAPM embodies a theory of what can be inferred about expected returns when markets are in equilibrium and when all investors have homogeneous expectations and pursue a mean-variance optimising objective (van Rensburg & Robertson, 2003a). The CAPM is shown in the following form:

$$R_i - r_f = \alpha + \beta (R_m - r_f) \qquad (2)$$

where

$R_{i\,is}$ the return on a particular investment, i,

r_f is the return on a risk-free asset,

R_m is the return on the market portfolio,

β is the sensitivity parameter of the investment to the market and

α is the excess return earned by the investment above the return on the market portfolio

However, an important limitation of the CAPM is its consideration for only systematic risk when estimating expected returns. As a result, the CAPM as a model of expected returns, has been discredited, especially due to the discovery of various anomalies.

According to Fama and French (1993), the most prominent anomaly is the size effect by Banz (1981) who found that market equity adds to the explanation of the cross-section of average returns provided by market. Furthermore, Rosenberg, Reid and Lanstein (1985) report the book-to-market anomaly after they found prices on the NYSE are inefficient since average returns on U.S. stocks are positively related to the ratio of a firm's book value of common equity to its market value. In their study, Fama and French (1993) found anomalies of size, price-earnings ratio, leverage and book-to-market had strong individual relationships with the average returns realized on portfolios sorted according to these characteristics. However, the combination of size and book-to-market, seemed to describe the cross-section of average stock returns as well as absorbing the effects of leverage and the earnings-to-price ratio. In conjunction with the CAPM, the size and book-to-market factors form the Fama and French model three factor model. Carhart (1997) further modified the Fama and French three factor model to include momentum, forming the Carhart four factor model.

2.1.2.2. South African normal return models

In South Africa, work on a normal return model began with van Rensburg and Slaney (1997), who advocate for the use of a two factor Arbitrage Pricing Theory (APT) model instead of the CAPM due to the market segmentation of the JSE. Market segmentation refers to the dichotomy in the return generating processes underlying JSE industrial and mining shares (van Rensburg, 2002). Van Rensburg and Slaney (1997) show that a two factor APT model comprising of the JSE Actuaries All Gold and Industrial indices has explanatory power for many cross-sectional irregularities on the JSE. Furthermore, their

two factor APT model was more appropriate for pricing assets on the JSE than the CAPM. These findings were reinforced in a subsequent study by van Rensburg (2002), with the two factors being updated to the JSE's Financial & Industrials Index (JSE index code J213, colloquially known as the *Findi*) and the JSE's Resources Index (JSE index code J210, colloquially known as the *Resi*) after the reclassification of the JSE.

While van Rensburg and Slaney (1997) used factors related to macroeconomic variables to determine expected stock returns, studies by van Rensburg (2001) and van Rensburg and Robertson (2003b) have both examined the presence of style-based effects on the JSE. Using the portfolio approach of Fama and French (1993), van Rensburg (2001) finds anomalies associated with earnings yield, past twelve-month (positive) returns, market capitalisation, dividend yield, six months' past returns, leverage, cash-flow to debt, turnover and three month's positive past returns. These anomalies persist even after risk-adjustment using the two factor APT model of van Rensburg and Slaney (1997). The author finds price-to-earnings, market capitalisation and momentum variables form a parsimonious representation of style-based risk on the JSE.

Employing the characteristic-based approach, which cross-sectionally regresses share returns over a particular period on values of various style characteristics, van Rensburg and Robertson (2003b) aimed to specify a style-based model of expected returns for the JSE. While this was their explicit aim, the authors state that their study can also be thought of as a 'multi-anomaly' test of the CAPM. In their study, they found CAPM anomalies of price-to-net asset value (NAV), dividend yield, price-to-earnings ratio, cash flow-to-price and size. Interestingly, much like the CAPM and in line with to van Rensburg (2001)'s findings, van Rensburg and Slaney (1997)'s two factor APT decomposition of risk did not succeed in removing the anomalies identified by van Rensburg and Robertson (2003b). Due to issues of multicollinearity among the values factors of cash flow-to-price, dividend yield, price-to-earnings, price-to-profit and price-to-NAV, the authors specified a two-factor style-based model using size and price-to-earnings as explanatory variables for the cross-section of JSE returns.

The significance of the book-to-market variable in Fama and French (1993)'s study led Auret and Sinclaire (2006) to examine the robustness of van Rensburg and Robertson (2003b)'s Size-P/E model by including book-to-market as an explanatory variable. In line with Fama and French (1993), the authors found that the book-to-market variable plays a strong role in explaining variation in stock returns on the JSE. The book-to-market attribute remarkably rendered both the size and P/E variables totally insignificant. However due to high collinearity between the book-to-market attribute and other variables with high explanatory power such as dividend yield and cash flow-to-price, the authors support the use of the Size-P/E model of van Rensburg and Robertson (2003b), which boasts explanatory variables with very low correlation.

Basiewicz and Auret (2009) examined the cross-section of average returns on the JSE using a data sample of all firms listed on the JSE from December 1989 to July 2005. Similar to Auret and Sinclaire (2006), the authors found the book-to-market variable to have significant explanatory power to predict returns. However, contrary to findings by Auret and Sinclaire (2006), the book-to-market variable in the author's study did not render the size variable insignificant. Furthermore, the authors found the price-to-earnings anomaly almost dissipates after adjusting for trading costs and illiquidity premiums.

Basiewicz and Auret (2010) examined the feasibility of the Fama and French three factor model in South Africa by investigating whether it could explain the size and value effects on the JSE. By replicating Fama and French (1993)'s study, the authors found support for the use of the Fama and French three factor model on the JSE.

More recent studies in South Africa report evidence of size, momentum and book-to-market anomalies. Hoffman (2012) examined the presence of stock return anomalies for stocks listed on the JSE between 1985 and 2010. The author found size, book-to-market and momentum effects to be the most significant anomalies while Kruger (2014), who investigated return predictability on the JSE for the 2002-2009 sample period, found cash

flow-to-price, earnings yield (inverse of price-to-earnings), book-to-market, momentum and size were all significant variables in explaining return predictability.

2.1.3 Conclusion

While initial event studies on M&A and other corporate events focused on short-term returns around announcement dates, a growing body of work has investigated long-run returns to these events. Studies on long-run performance are, however, hampered by the shortcomings of the different methodologies used to estimate long-run returns and the accuracy and reliability of models used to estimate normal returns, i.e. the return that would be expected in the absence of the event. In the next chapter, in addition to briefly discussing prior research on short-term M&A studies, it is shown how the use of different methods and normal return models has impacted the outcome of various M&A studies around the globe.

Chapter 3: Literature review and hypothesis development

As stated earlier, this study is primarily concerned with the long-run share return performance of South African acquirers, as this area of research remains largely unexplored. As such, short-run literature is only briefly discussed in this chapter. With regards to long-term event studies, the main concern centers around the statistical robustness of the methodologies used and the measurement of expected returns, which serve as a benchmark for expected returns. The literature review begins by discussing short-run performance around M&A announcement dates. The attention then turns to long-run event studies. Findings from international and South African long-term M&A studies are then presented and the chapter concludes with a discussion on the determinants of abnormal returns for long-term post-merger performance and development of hypotheses.

3.1 Short-term M&A event studies

Researchers such as Andrade, Mitchell and Stafford (2001) argue that the most statistically reliable evidence on the value-creation of M&A for shareholders comes from short-term event studies. While long-term event studies are hampered by concerns about methodological choices and the joint-test hypothesis (tests of whether abnormal returns are zero are also tests of whether the assumed model of expected or normal returns is correct), this is not the case for short-run event studies (Andrade, Mitchell & Stafford, 2001).

The bulk of literature on short-run M&A returns reports positive abnormal returns to targets around M&A announcement dates (Agrawal & Jaffe, 2000). However, short-run M&A literature is inconclusive on the returns to bidders or acquirers. Furthermore, bidders and acquirers in developed markets seem to earn higher abnormal returns than their counterparts from emerging markets.

Yilmaz and Tanyeri (2016) conducted one of the most comprehensive studies on returns around M&A announcement dates. The authors examined short-term returns to both bidders and targets in a global sample consisting of 263461 deals across 47 countries,

from 1992 – 2011. Their study found significant abnormal returns to both bidders and targets in both developing and emerging markets. However, their study also found a significant difference in returns to bidders in developed countries versus their emerging markets counterparts, with bidders from developed countries outperforming those from developing countries. The authors attribute this difference to two reasons.

Firstly, developed markets are more efficient than emerging markets due to their higher liquidity, and also due to the greater political uncertainty in emerging economies. In a capital market that is efficient with respect to public information, stock prices quickly adjust following a merger announcement. The efficiency of developed capital markets is further illustrated in the findings of studies by Dutta and Jog (2009) and Mager and Meyer-Fackler (2017).

Dutta and Jog (2009) examined 989 acquiring events involving Canadian firms between 1993 and 2001. While their study finds significant positive abnormal returns around the announcement date, the Canadian market subsequently corrects for its initial positive reaction to news of the acquisition as abnormal returns become insignificant within 15 days after the announcement date.

Similarly, Mager and Meyer-Fackler (2017) investigated announcement date returns for 338 German M&A transactions between 1981 and 2010. For most of their sample, the authors found no significant abnormal returns around M&A announcement dates. However, while their 2001-2010 sub-sample showed significant positive abnormal returns within five days of an M&A announcement, this was corrected for within 20 days of the announcement date.

Secondly, Yilmaz and Tanyeri (2016) suggest that information leakages may account for lower abnormal returns in emerging market countries. If there are any information leakages, the effect of M&A announcements might be reflected in stock prices prior to the announcement date and as a result any abnormal returns around the announcement date insignificant.

The possibility of information leakage could potentially explain why studies on short-term returns to South African companies resulting from merger and acquisition deals found no significant abnormal returns. For example, Mushidzhi and Ward (2004) found no significant abnormal returns to bidders when they examined 57 M&A transactions between 1998 and 2002 over 3- and 21-day periods around announcement dates.

Similarly, Smit and Ward (2007) did not observe any statistically significant abnormal returns from their study that examined 27 M&A between 2000 and 2002 over four event windows around the announcement date, i.e 21 days, 11 days, 5 days and 3 days. The proximity between the time frames used in the studies by Mushidzhi and Ward (2004) and Smit and Ward (2007) could be a possible explanation for the similarity in their results.

Lastly, a more recent short-term study by Ndlovu (2017) had similar findings to the two previously discussed South African studies. The study did not find any significant abnormal returns from a sample of 34 M&A between 2003 and 2013 in the 21 days around announcement dates.

3.2 Long-term M&A event studies

This section of the literature review starts by providing an overview of long-term M&A studies outside South Africa that employ the aforementioned stock price movements methodologies, *i.e.* the CAAR, BHAR and CTP approaches and accounting measures such as returns on assets. The focus then turns to discussing findings from South African long-term M&A studies.

3.2.1 International research

The vast majority of research on M&A has been confined to developed countries (Ramakrishnan, 2008), specifically the United States (US), the United Kingdom (UK) and Canada.

3.2.1.1 Stock price movement studies

Early findings on the presence of long-term abnormal share returns from M&A are inconsistent. Mandelker (1974), Langetieg (1978) and Firth (1980) conducted the earliest investigations on M&A. While Mandelker (1974) and Langetieg (1978) examined M&A returns for New York Stock Exchange (NYSE) firms, Firth (1980) conducted one of the first major studies of mergers and takeovers in the UK. Mandelker (1974), Langetieg (1978) and Firth (1980) all found no significant abnormal returns from M&A.

In contrast to Mandelker (1974) and Langetieg (1978), who conducted their studies using monthly returns, Asquith (1983) used daily abnormal returns to examine long-term post-merger performance. Using a sample of 196 NYSE or American Stock Exchange (AMEX) acquirers in successful mergers with NYSE targets over the 1962-1976 period, Asquith (1983) found statistically significant CAARs of -0.072 in 240 days following the merger. Abnormal returns were calculated as the difference between the return on the merging firm and the return on a control portfolio with a similar beta.

Using the same data but different methodologies, Bradley and Jarrell (1988) and Magenheim and Mueller (1988) reached different conclusions. Both Bradley and Jarrell (1988) and Magenheim and Mueller (1988) examined 78 NYSE/AMEX acquiring firms that completed takeovers worth at least $15 million over the 1976-1981 period. Magenheim and Mueller (1988) found significant CAARs in the three years following the merger. However, Bradley and Jarrell (1988) criticized their approach of using market parameter estimates based on monthly data as it is inefficient and non-stationary. Similar to Asquith (1983), Bradley and Jarrell (1988) used daily abnormal returns to examine post-merger performance. They calculated daily abnormal return as the difference between the merging firms return and the return on a portfolio of securities of similar beta and found insignificant CAARs of –0.16 over the first three post-acquisition years.

Further inconsistency is highlighted in Franks and Harris (1989)’s study. Using a method similar to Firth (1980) but a larger sample size, Franks and Harris (1989) examined the returns to UK acquirers. While using the benchmarks of returns relative to the market

index and the CAPM resulted in statistically significant CAARs of 0.05 in the 24 months following the M&A, the CAARs of –0.126 were statistically significant under the market model.

Up until this point, the literature was divided on the presence of any anomaly in long-run post-merger performance. To resolve this puzzle, Franks, Harris and Titman (1991) used a more robust set of benchmarks to proxy normal returns than prior studies. The authors justified the use of multifactor benchmarks from portfolio evaluation literature to overcome mean-variance inefficiencies of single factor benchmarks. The four benchmarks were; the Chicago Research in Security Prices (CRSP) equally-weighted index, the CRSP value-weighted index, a ten-factor benchmark and an eight-portfolio benchmark which consists of four portfolios based on firm size, three based on dividend yield and one based on past returns.

Using the CTP approach and examining 399 U.S. takeovers in the 1975-1984 period, the CRSP value-weighted index yielded and CRSP equally-weighted index yielded significant monthly abnormal returns of 0.3% and -0.2%. However, the ten-factor benchmark and an eight-portfolio benchmark yielded no significant abnormal returns. The authors hence conclude that there are no long-term post-merger abnormal returns and prior findings of negative post-merger returns are due to benchmark errors than mispricing at the time of the announcement.

Most of the studies following Franks, Harris and Titman (1991) employ more robust benchmarks, with the majority providing stronger evidence for zero abnormal performance. Agrawal, Jaffe and Mandelkar (1992) examined mergers over 1955 to 1987 between NYSE acquirers and NYSE/AMEX targets. The authors also made a significant contribution to M&A long-term literature by suggesting an adjustment for firm size in M&A studies. The adjustment is particularly important in M&A studies because acquirers are usually large firms (Agrawal, Jaffe & Mandelkar, 1992). After adjusting for firm size and beta, they found that shareholders of acquiring firms suffer a statistically significant loss, with CAARs reaching –0.1026 by month +60.

However, the authors found that while five-year CAARs are significantly negative for mergers that took place in the 1950s, the 1960s and the 1980s, the CAARs are insignificantly positive over the 1970s period. Furthermore, when they examined the 1975-1984 period from Franks et al. (1991), the authors also found no abnormal performance. This may suggest that M&A results are specific to the sample period.

Following Agrawal, Jaffe and Mandelkar (1992), Higson and Elliott (1993) considered the size effect in their study of completed UK takeovers between 1975 and 1990. The authors measured BHARs as opposed to the CAARs that had dominated M&A and other event studies since Fama *et al.* (1969). Abnormal returns were measured against a size benchmark. The authors found no evidence of significant abnormal stock price performance over the 36 months after takeover completion.

In their paper, Loughran and Vijh (1997) examined 947 acquisitions from the NYSE, the AMEX, and NASDAQ between 1970 and 1989. Abnormal returns were measured as the difference between five-year holding period returns of sample stocks and matching stocks chosen to control for size and book-to-market effects. Using the BHAR approach, the five-year abnormal returns were found to be marginally significantly different from zero after adjusting for cross-correlation in returns.

The BHAR approach has however been criticized by Fama (1998), as well as Mitchell and Stafford (2000), for its susceptibility to cross-correlation of returns across events. They both advocate for the use of the CTP approach to mitigate this problem. In one of the most cited event studies, Mitchell and Stafford (2000) examined 2,193 acquisitions over the period 1961–1993 as part of their study using the BHAR and CTP approach. After adjusting for positive cross-correlations of individual event firm BHARs, there was no statistical evidence for abnormal returns. Mitchell and Stafford (2000) therefore suggest correction for positive cross-correlations of individual event firm under the BHAR approach using an adjusted t-statistic. From the CTP approach, they found acquirers tend to significantly underperform in the 3 years following the acquisition on an equal-weighted basis while there was no evidence for underperformance on a value-weighted basis.

Following Mitchell and Stafford (2000), a number of studies have used both methods to compare the significance of the difference in results, if any.

Moeller, Schlingemann and Stulz (2003) examined a sample of 12,023 acquisitions by US public firms from 1980 to 2001 using both the CTP and BHAR approaches. For the CTP approach, the authors estimated normal returns using the Carhart four-factor model and from a three-year holding period, they found an insignificant monthly abnormal return. They also estimated the three-year BHAR by matching each sample firm to a firm based on the closest monthly market value of assets within the same yearly equity book-to-market quintile measured one month after the completion of the transaction. They found acquiring firms to significantly underperform with abnormal returns of -16.02%. However, this could be due to the cross-correlation between returns suggested by Mitchell and Stafford (2000) and Fama (1998) that the authors did not make an adjustment for.

Andre, Kooli and L'Her (2004) estimated long-term post-merger performance for 267 Canadian M&A events between 1980 and 2000. The authors considered both variations of the CTP approach: the alpha coefficients from the Fama and French-Three Factor Model (FF-TFM) and the Mean Calendar-Time Abnormal Returns (MCTAR). The alpha coefficients from the FF-TFM approach reported a significant underperformance of -0.523% per month when they measured the three-year post-acquisition abnormal return of the average Canadian acquirer using equal-weighted returns. The value-weighted returns yielded an unexpectedly positive three-year post- acquisition abnormal return of 0.322% on average per month. When they examined MCTARs on an equal-weighted basis, acquirers earned significantly negative abnormal returns in the three years following the M&A, averaging -1% per month while on a value-weighted basis, the observed underperformance is statistically insignificant with a MCTAR average of -0.46% per month.

For robustness, the authors address any possible cross-sectional dependence in their results by examining only non-overlapping cases. If an acquisition occurred within three years of a previously included acquisition by the same firm, the authors removed the latter

observation. With no overlapping cases, the results indicate that Canadian acquirers significantly underperformed using both the value-weighted and equal weighted schemes. Although the authors only report calendar-time results, they state that event-time results do not significantly alter the overall conclusion they reach suggest that Canadian acquirers significantly underperform over the three-year post-event.

Dutta and Jog (2009) investigated three-year stock return performance of 1300 Canadian M&A events in the 1993–2002 period starting from the effective date of a completed deal. For the BHAR approach, the authors considered two approaches to calculate expected returns: reference portfolio returns and control firm returns. The chosen benchmarks for the reference portfolio returns were the TSX 300 index return and the value-weighted Canadian Financial Market Research Center index (CFMRC) returns. The control firm returns where benchmarked with returns from matching firms selected based on the nearest propensity to the sample firms' size and price-to-book-value factors.

The authors found no significant abnormal results for the BHAR control firm approach after adjusting their t-statistics as suggested by Mitchell and Stafford (2000). However, the two reference portfolio approaches using the SX 300 index return and the value-weighted Canadian Financial Market Research Center (CFMRC) index returns showed significant levels of underperformance (54% over three years) even with adjusted t-statistics. The significant abnormal returns however disappear when the authors consider only non-overlapping acquisitions. The authors focus on the results from the control firm approach since it eliminates the new listing, rebalancing, and skewness biases.

For the CTP approach, Dutta and Jog (2009) use the Fama and French three factor model as a normal return model. Consistent with the BHAR control firm approach, the CTP results did not show any evidence of long-term underperformance for Canadian acquiring firms. In summary, by using both the BHAR and CTP approach, the authors do not find any strong support for long-term underperformance for acquiring firms.

Mager and Meyer-Fackler (2017) examined the long-term performance of German acquiring firms for M&A transactions that took place between 1981 and 2010 for a 36-month holding period using both the BHAR and CTP approaches. As reference portfolios for the BHAR approach, they chose the respective German industry indices, the German CDAX total return index, and European industry indices as they believed that industry-adjusted returns best captured abnormal return effects in their sample. For the full sample period, no significant abnormal returns were found when they used the adjusted t-statistic suggested by Mitchell and Stafford (2000) that accounts for cross-sectional dependence and skewness. The CTP using the Carhart four factor model as a benchmark for expected results exhibited an overall insignificant positive alpha. In conclusion, their study did not find any significant negative abnormal long-term performance.

Taken as a whole, studies that utilized stock price movement methodologies suggest zero abnormal returns for M&A acquirers in the long-run. Despite earlier studies suggesting the possibility of abnormal returns, findings from more recent studies that employ more robust methodologies and benchmarks indicate that there is no abnormal return.

3.2.1.2 Accounting studies

Although stock price movement studies have dominated M&A literature, some researchers have turned to accounting measures to determine the long-term performance of acquiring firms. According to Healy, Palepu and Ruback (1992), stock price studies are unable to distinguish between real economic gains and market inefficiencies. Healy, Palepu and Ruback (1992) further argue that cash flows are representative of the actual economic benefits generated by assets following M&A. Specifically, Healy, Palepu and Ruback (1992) advocate for the use of pre-tax operating cash flows which exclude the effect of depreciation, interest expense and income, goodwill and taxes to ensure that their results are comparable over time.

In their study, Healy, Palepu and Ruback (1992) investigated the 50 largest mergers between U.S. public industrial firms completed in the period 1979 to mid-1984 to determine the post-acquisition operating performance of merged firms. Using pre-tax

operating cash flow returns on assets to measure improvements in operating performance, they found merged firms had significant improvements in operating cash flow returns from the merger after controlling for industry.

However, Switzer (1996) suggests that it is difficult to draw meaningful conclusions from the study by Healy, Palepu and Ruback (1992). They argue that Healy, Palepu and Ruback (1992) analyzed a small sample of only very large mergers and dealt with the time period generally referred to as "merger mania". Switzer (1996) therefore uses a large sample of 324 acquisitions, drawn from the twenty-year time period of 1967-1987 and a similar methodology to Healy, Palepu and Ruback (1992). In their study, Switzer (1996) found significant improvements in the operating performance of merged firms for a large sample of M&A over the 1967-1987 period hence concluding that the results presented by Healy, Palepu and Ruback (1992) were not biased by the size of their sample or the fact that they examined only mergers which occurred during the "merger mania" period.

In contrast to Healy, Palepu and Ruback (1992) and Switzer (1996), who use pre-tax operating cash flows to estimate improvements in performance after M&As, Dickerson, Gibson and Tsakalotos (1997) use pre-tax profits as a proportion of the average opening and closing net assets to examine the impact of acquisitions on a panel of UK firms. They found M&A to have a negative long-term effect on profitability, as measured by return on assets. The authors examined the robustness of their findings by changing the rate-of-return. They calculated the return on assets using operating profit and pre-tax profits less interest but found that these changes had no substantial effect on their initial findings.

Further criticism of Healy, Palepu and Ruback's (1992) study came from Ghosh (2001). The author argues that the use of operating performance from industry-median firms as a benchmark for outperformance of event firms is flawed. The author suggests that merging firms outperform industry-median firms over pre-acquisition years which implies that estimates of improvements in cash flow after the merger are biased upwards. As a benchmark for outperformance, the authors use control firms matched on performance and size from pre-event years.

Using Healy, Palepu and Ruback's (1992) research design and a sample of large acquisitions between 1981 and 1995, the author finds merging firms' post-acquisition operating cash flow performance increases significantly. However, the author also finds that merging firms systematically outperform industry-median firms over the pre-acquisition period. There is no evidence of improvement in operating performance after accounting for any superior pre-acquisition performance, especially when firms are matched on pre-acquisition performance and size as a benchmark.

The inconsistent findings in prior literature motivated Martynova, Oosting and Renneboog (2006) to investigate the long-term profitability of corporate takeovers of which both the acquiring and target companies are from Continental Europe or the UK. Martynova, Oosting and Renneboog (2006) criticize the use of pre-tax operating cash flows by Healy, Palepu and Ruback (1992), Ghosh (2001) and Switzer (1996). They argue that pre-tax operating cash flows ignore changes in working capital after M&A. The authors therefore employed four different measures of operating performance: Earnings before Interest, Tax, Depreciation and Amortization (EBITDA) and EBITDA corrected for changes in working capital, each scaled by the book value of assets and by sale. Using a sample of European acquisitions that were completed between 1997 and 2001, Martynova, Oosting and Renneboog (2006) found the profitability of combined firms decreases significantly after M&A although the decrease becomes insignificant after controlling for size, industry and pre-acquisition performance using returns from peer companies.

Using a sample of 87 domestic mergers, Ramakrishnan (2008) statistically analyzed cash flow accounting measures to study whether post-merger firm performance improved in the long-term. Similar to Healy, Palepu and Ruback (1992), Ghosh (2001) and Switzer (1996), the author uses pre-tax operating cash flow returns scaled by operating assets of the sample firms to measure post M&A performance. The paired t-test is used to compare industry-adjusted cash flows of each of the three post-merger years against each of the three pre-merger years. The study finds that in the long-run, merged firms have improved performance. Further research by the author into the source of economic gains attributes it to enhanced efficiency in the utilization of assets and accrued synergistic benefits.

Rao-Nicholson, Salaber and Cao (2015) examined the long-term performance of 57 M&A in the Association of Southeast Asian Nations (ASEAN) region between 2001 and 2012. The authors use pre-tax cash flows to calculate two measures of M&A performance: the combined return on assets (ROA), measuring the firms' profitability, and the combined sales margin, calculating firms' effectiveness. The authors calculated two benchmarks: the industry median control firm as well as a size and pre-acquisition performance control firm. Two performance measures and two control benchmarks resulted in four adjusted measures of operating performance. Similar to Ghosh (2001), the authors found that merging firms significantly outperformed their industry benchmark before the M&A. Only the industry adjusted ROA showed a significant decrease in operating performance between pre and post- acquisition performance. There was no significant underperformance for the other three measures of operating performance.

3.2.2. South Africa

In contrast to overseas markets, South African literature on long-term M&A performance is limited. However, similar to international studies, research on South African M&A is inconclusive on the presence of an anomaly although the majority of the studies suggest there is no significant return to acquirers to M&A in South Africa. Given the limited research on South African M&A, the study does not present accounting and stock price movement studies separately.

Wimberley and Negash (2004) focused on M&A in the industrial sector as it accounted for a third of the M&A value between 1989 and 1998. Abnormal monthly returns were calculated as the difference between the return of the sample firm and the return on a benchmark portfolio that controlled for size and book-to-market value. The authors found a significant Cumulative Abnormal Return (CAR) of -10.5% in the first 36 months after the deal announcement date.

Smit and Ward (2007) investigated the impact of 27 large acquisitions on the share price and operating financial performance of acquiring firms on the JSE during 2001-2003. The impact on operating financial performance was determined from cash flow return on

assets. Following Healy, Palepu and Ruback (1992), the abnormal cash flow return on assets was determined by comparing the cash flow return on assets for each acquisition with the same period's median cash flow return on assets of the relevant acquiring company's industry sector (but excluding the cash flow return on assets of the relevant acquiring company). Based on the findings of insignificant changes in the industry-adjusted operating financial performance of the acquiring firms on the JSE, the authors concluded that on average, large acquisitions create no wealth for their shareholders.

While the impact of M&A of on the share price of acquiring firms in Smit and Ward (2007)'s study was short-term in nature, Kyei (2008) built on their work by examining the long-term impact of M&A on the share price of JSE acquiring firms. Using a similar methodology to Wimberley and Negash (2004), abnormal returns for 14 M&A transactions were calculated against a benchmark consisting of 12 factor portfolios that controlled for size (small, medium or large), price-to-book (value or glamour) and resource or non-resource firms. However, in contrast to Wimberley and Negash (2004), the authors calculated daily abnormal returns. With a positive but insignificant CAAR of 1,37% in 378 trading days after the merger, the study concluded that large acquisitions had statistically no impact on the long-term share price returns of JSE listed acquiring companies. Using identical methodology and control portfolios, Stafford (2012) found a positive but insignificant CAAR of 13.15% in 228 trading days after the merger when he examined 39 large acquisitions on the JSE.

3.3. Determinants of the long-run performance of M&A deals

The previous section of the literature review compared findings from M&A studies. Due to the different conclusions reached in these studies, several researchers have looked for explanations. In this segment, the various deal-specific and firm-specific factors that are typically discussed in the literature to explain the long-run performance of M&A deals are discussed. Such factors include; method of payment (stock, cash or both stock and cash), target type (public, private or subsidiary), type of activity (conglomerate or non-conglomerate), deal attitude (friendly or hostile), the nature of acquirer (glamour or value) and target geography (cross border or non-cross border).

The method of payment hypothesis suggested by Myers and Majluf (1984) states that firms pay with equity when their stock is overvalued but pay with cash when their stock is undervalued. More recent studies by Loughran and Vijh (1997), Andre, Kooli and L'Her (2004) and Mager and Meyer-Fackler (2017) find support for the method of payment hypothesis, as equity-financed M&A underperformed. Dutta and Jog (2009) found support for the above hypothesis when using BHARs with the matching firm return benchmark, but do not find any strong evidence of underperformance from CTP approach alphas.

Under the performance extrapolation hypothesis, Rau and Vermaelen (1998) suggest that the market over-extrapolates the glamour (low book-to-market) acquirers' previous performance when assessing the value of a bid which translates into managers being more likely to overestimate their own abilities to manage an acquisition. On the other hand, managers of companies with value (high book-to-market) stocks will be more prudent in approving major acquisitions that may well determine the survival of the company and as a result of this prudence, they should create more value than destroy it (Rau & Vermaelen, 1998). This hypothesis was consistent with the results from their study: They found value acquirers to significantly outperform glamour acquirers by 25% when they examined 3169 merges that were effective between 1980 and 1991 for acquiring firms listed on the NYSE, AMEX and NASDAQ. Mitchell and Stafford (2000), Dutta and Jog (2009) and Mager and Meyer-Fackler (2017) find no evidence of reliable differential performance between glamour and value acquirers. The results of Andre, Kooli and L'Her (2004) support the performance extrapolation hypothesis, as glamour acquirers underperformed value acquirers.

Numerous researchers report that conglomerate mergers underperform horizontal/ related mergers because managers are not familiar with the target industry (Andre, Kooli and L'Her, 2004). The aforementioned researchers suggest that horizontal mergers should benefit from synergies such as economies of scale and a stronger market share. From their sample, they found conglomerates underperform horizontal mergers in the long-run. Mager and Meyer-Fackler (2017) did not find any significance for the difference between long-term performance of horizontal mergers and conglomerate mergers while

Dutta and Jog (2009) found significant abnormal returns for horizontal mergers, but not for conglomerate mergers.

The internalization theory states that cross-border M&A may help create value for acquiring firms if such firms tap into their expertise and know how on international markets (Francoeur, 2007). Francoeur (2007) finds that Canadian firms carrying out cross-border M&A do not generate significant abnormal returns in the five-year period after the announcement month. Andre, Kooli and L'Her (2004) find cross-border M&A to perform worse than non-cross-border M&A, while the findings of Mager and Meyer-Fackler (2017) and Dutta and Jog (2009) find no significance for the difference between cross-border and non-cross border M&A.

Most studies reviewed for this research project did not analyze the listing effect of the acquired firm and its correlation with M&A returns. The published studies that did were short-term in nature. In the US, it is found that bidder shareholders gain when the bidding firm buys a private firm or a subsidiary of a public firm and lose when the bidder buys a public firm (see Fuller, Netter and Stegemoller, 2002; Chang and Tsai, 2013). These authors propose that this is because when bidders acquire private firms or subsidiaries, they are purchasing assets in a relatively illiquid market and hence the liquidity discount results in a higher return to bidder shareholders. Faccio, McConnell and Stolin (2006) investigated the listing effect in 17 Western European countries over the period 1996–2001 and found that acquirers of public targets had an insignificant average abnormal return of −0.38%, while acquirers of unlisted targets earned a significant average abnormal return of 1.48%.

Unsurprisingly, there is limited literature on the explanations of long-term performance of South African acquirers. The method of payment hypothesis has been the most researched. Smit and Ward (2007) found no significant differences between the operating financial performance of cash-funded acquisitions and share-funded acquisitions. Similarly, Stafford (2012) found no statistically significant difference between the CAARs of share-funded and cash -funded acquisitions for a 229-day event window. However,

even though this difference was insignificant, in line with the method of payment hypothesis, it was found that share-funded acquisitions performed better than cash - funded acquisitions.

3.4 Hypothesis development

In this section, the study develops hypotheses based on theoretical principles and the findings from prior studies as discussed above.

3.4.1. Short-term hypothesis.

In the brief discussion on short-term returns to M&A candidates, the literature showed returns to short-term studies in developing countries are lower than those from developed countries. Yilmaz and Tanyeri (2016) show one explanation for this difference is the information leakages prior to M&A announcements in developing countries. As South Africa is considered a developing market, the possibility of information leakage suggests announcements of M&A have no short-run impact on the price of acquirers or merged firms and thus do not have any impact on the value creation for shareholders. The null hypothesis therefore states that announcements of M&A do not affect short-term shareholder value of the acquirer firms involved in the M&A transactions. The alternative hypothesis states that M&A announcements result in significant short-term abnormal returns for acquirers and therefore affect short-term shareholder value. The hypotheses are tested by using a two-sided t-test at the 1%, 5% and 10% levels of significance.

3.4.2. Long-term hypothesis

While prior long-term studies on M&A were inconclusive on the presence of abnormal returns to acquirers, the majority of more recent studies that use more robust methodologies and normal return benchmarks find no significant abnormal returns to acquirers. As this study employs similarly robust methodologies and benchmarks that are appropriate for the South African equity market, the null hypothesis states that there is no significant long-run abnormal share return to South African acquirers. The alternative hypothesis states that there is significant long-run abnormal share returns to South African acquirers. The hypotheses are tested by using a two-sided t-test at the 1%, 5% and 10% levels of significance.

3.5. Conclusion of literature review

In the literature review chapter, the study briefly discussed the literature on short-term M&A studies, focusing on the difference between returns to acquirers in developing countries in comparison to developed countries. The focus then turned to long-term studies where the significance of using different methodologies and benchmarks to calculate M&A long-term return was stressed. Various studies have drawn different conclusions on the impact of M&A on long-term firm performance. The lack of a general consensus from these studies as well as the different methodologies used makes it hard to draw a definitive conclusion on the impact of M&A on long-term firm performance both internationally and in South Africa. However, it was shown that while earlier studies were inconclusive on the presence of significant abnormal returns, the majority of more recent studies that utilize more robust methodologies and benchmarks find no significant abnormal long-term return to acquirers in M&A. Lastly, the possible explanations for the long-run performance were examined. The vast majority of the literature discussed are confined to developed countries. The long-term post-acquisition performance in South Africa remains largely unexplored.

Chapter 4: Data

Three main datasets are used for the analysis of South African M&As. The first of these is the event data set comprising of South African M&A deals and their characteristics. The second is the time series of total returns generated by the entities in the event data set while the third data set constitutes the returns to the factors used in the normal return model against which abnormal returns are benchmarked.

4.1. Event data set

The event data set (*i.e.* the sample of South African M&A deals and their characteristics) is obtained from the Thomson Reuters Datastream terminal at the University of Cape Town main library. Event data meet the following criteria:

1) Deals were effective between 2003 and 2014. In conducting event studies, practitioners need to be weary of the possibility that their results might be time varying. Using longer time periods might indicate results only present at a given point in time rather than consistent phenomena while shorter time periods restrain the applicability of the event study's findings. For this study, 2003 is chosen as a starting point to limit any impact of the rebasing and replacement of the JSE Actuaries indices with the new joint venture FTSE/JSE Africa Index Series in 2002, as the study intends to use returns to JSE indices in its examination of returns to South African acquirers. Given the long-term nature of the study, 2014 is chosen as a cut-off point so that post-event returns up to three-years can be investigated.

2) Deals are mergers or acquisitions. All forms of acquisitions are considered, *i.e.* acquisitions of partial interest, acquisitions of remaining interest, acquisitions of assets and acquisitions of majority assets.

3) Deals involve transactions greater than US$10 million. Following Andre, Kooli and L'Her (2004), this limitation is imposed to ensure that transactions are large enough to ensure that any economic gains are detectable.

4) Deal acquirers are public companies listed on the JSE to ensure that share prices, which are fundamental to measuring long-run performance, are readily available.

5) Deals are completed.

This set of criteria led to an initial sample of 291 deals. However, only acquirers with at least three-years of returns after completing a transaction can be considered for further analysis.

4.2. Returns data set

The time series of the total returns generated by the sample firms in the event data set is obtained from the Bloomberg terminal at the University of Cape Town main library. It is important to use total returns instead of only share price returns, as the dividends captured within the total return numbers are potentially directly or indirectly affected by the merger and acquisition transactions under consideration, and furthermore are an important part of the returns that shareholders receive from their investment. Only acquirers that were listed for a sufficient period to generate three year returns after the completion date of their M&A were considered for further analysis. This led to a final sample of 204 M&As. The descriptive statistics for this final sample are presented in Table 1 and Figure 1.

Daily and monthly periods are the usual candidates for the computing of returns in the majority of M&A studies. However, statistical inference using daily returns, and to a lesser extent weekly returns, is hampered due to thin trading effects. Scholes and Williams (1977) highlight the problem of thin trading, where stocks that trade less frequently generate returns that are serially correlated. Thin trading effects are more profound on the JSE than exchanges in developed markets such as the NYSE and London Stock Exchange (LSE), where trading is more frequent than it is on the JSE.

Since short-term studies investigate returns to acquirers in the few days following an announcement, daily returns have been utilized in the literature. The short-term segment

of this study therefore inevitably uses a daily return interval to analyze the impact of M&A announcements on acquirers. However, with respect to the long-term segment, a monthly return interval is preferred. This interval is chosen over the daily and weekly intervals to mitigate the impact of thin trading effects on returns from sample firms.

Table 1. Descriptive statistics for acquirers

Panel A. Top 10 transactions

Date Effective	Acquirer Name	Target Name	Deal Size (M USD)
9/14/2006	MTN Group Ltd	Investcom LLC	5237.001
8/1/2014	Woolworths Holdings Ltd	David Jones Ltd	2096.249
3/28/2011	Capital Property Fund Ltd	Pangbourne Properties Ltd	1832.753
4/26/2004	Anglogold Ltd	Ashanti Goldfields Co Ltd	1743.808
3/18/2011	Steinhoff International Holdings Ltd	Conforama SA	1653.424
12/1/2006	Gold Fields Ltd	Barrick Gold South Africa (Pty) Ltd	1524.999
9/1/2011	Hyprop Investments Ltd	Attfund Retail Ltd	1313.744
7/1/2009	Redefine Income Fund Ltd	ApexHi Properties Ltd	1105.872
12/31/2008	Sappi Ltd	M-real Corp-Coated Graphic Paper Business	1081.782
6/10/2011	Sasol Ltd	Talisman Energy Inc-Cypress A Assets, British Columbia	1062.692

Panel B. Distribution by year

Year	No of deals	Total deal value (M USD)	Average deal value (M USD)
2003	17	4897.03	288.06
2004	13	1302.79	100.21
2005	9	1267.42	140.82
2006	21	9399.73	447.61
2007	21	2666.51	126.98
2008	16	2331.07	145.69
2009	20	2141.31	107.07
2010	17	5803.25	341.37
2011	15	4530.02	302.00
2012	18	2134.73	118.60
2013	20	3680.15	184.01
2014	17	4447.41	261.61

Panel C. Frequency distribution of deal characteristics.

Target nation	South Africa	107
	Other	97
Method of payment	Cash	149
	Equity	19
	Cash and Equity	36
Industry relatedness	Yes	104
	No	100
Percentage acquired	50% or more	131
	Less than 50%	73
Deal attitude	Friendly	180
	Hostile	1
	Unsolicited	1
	Neutral	22
Form of transaction	Merger	60
	Acquisition of remaining interests	20
	Acquisition of partial interests	48
	Acquisition of majority assets	34
	Acquisition of assets	42
Target's listing status	Public	68
	Private	57
	Subsidiary	79

The sample consists of 204 observations for acquiring firms between 2003 and 2014. For acquiring firms, all events are considered in case of multiple acquisitions by the firm in any year. ‘‘Deal size” is the total transaction value in million US dollars. ‘‘Target nation” is a dummy variable with a value of ‘‘1” if the target is from South Africa and ‘‘0” otherwise. ‘‘Method of payment” is a categorical variable outlining the nature of transaction payment mode. Three categories are created: cash payment, equity payment and a combination of cash and equity. ‘‘Industry relatedness” is a dummy variable. For acquisitions within the same industry, the value is ‘‘1” and ‘‘0” otherwise. “Percentage acquired is a dummy variable: “1” represents the acquisition of 50% or more of the target company, and “0” otherwise. “Deal attitude” is a categorical variable with four categories: friendly, hostile, unsolicited and neutral. ‘‘Form of transaction” is a categorical variable with five categories: merger, acquisition of remaining interests, acquisition of partial interests, acquisition of majority assets and acquisition of assets. ‘‘Target’s listing status” is a categorical variable outlining the nature of target firm. Three categories are created: public target, private target, and subsidiaries

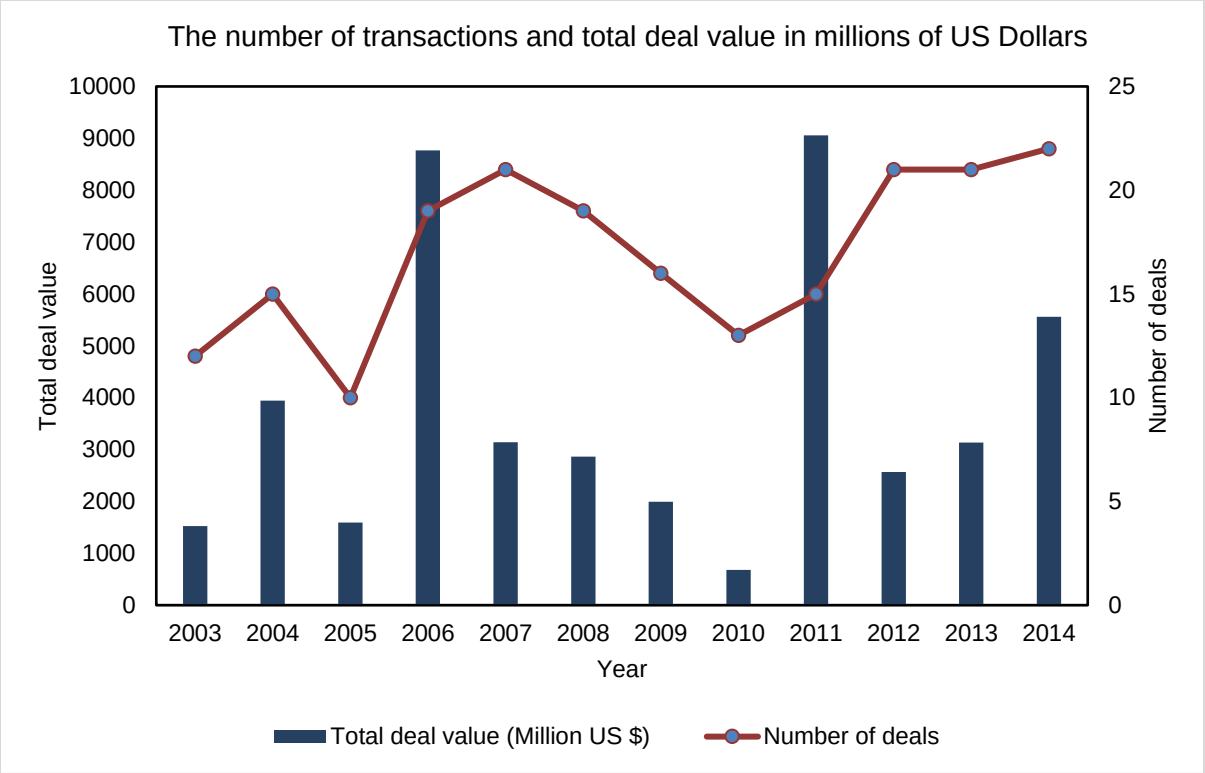

Figure 1. The number of transactions and total deal value in millions of US Dollars.

Figure 1 highlights the impact of the Global Financial Crisis (GFC) on South African M&A activity, as both total deal value and the number of deals reduced between 2007 and 2010. From 2011 onwards, the general trend has been an increase in both total deal value and number of deals, perhaps indicating a shift in business confidence after the GFC.

4.3 Normal return model data set

The normal return model data set consists of the returns to factors used to benchmark returns from South African acquirers. The preferred factors for this study are the JSE's Financial & Industrials Index (JSE index code J213 or *Findi*), the JSE's Resources Index (JSE index code J210 or *Resi*), size and value variables. Returns to the *Findi* and *Resi* indices are obtained from the Bloomberg terminal from the University of Cape Town main library while the size and value returns were downloaded from the Peregrine Securities Research South African factor data library. The justification for this factor selection is discussed in Chapter 5. In Chapter 5, the use of the three data sets to determine the performance of South African M&A in both the short and long-run is discussed.

Chapter 5: Methodology and results

This chapter begins with the justification of the normal return model that was briefly introduced in Chapter 4.3 and then proceeds to describe the methodology followed and the results of the investigation aimed at answering the three research questions forming the basis of this study. Firstly, how do South African acquirers share returns perform in the short-run? Secondly, how do South African acquirers perform in the long run in terms of share returns? To answer this question, the study considers both the BHAR and CTP approaches. Thirdly, what correlations exist between long-run share performance and specific selected attributes of merger and acquisition transactions? The study thus breaks the sample down into a number of possible determinants that are analyzed for possible explanations of the long-term performance of South African acquirers. The software used for this research is Event Study Metrics (see www.eventstudymetrics.com).

5.1 Normal return model

In selecting a model for normal returns, practitioners of event studies need to be cautious to avoid the bad model problem underlined in Fama's (1998) study. A bad normal return model is one that does not fully describe expected or normal returns. Even though bad models are ubiquitous, they are more severe for studies with longer horizons, since errors in expected returns grow faster with the return horizon than the volatility of returns (Fama, 1998). Practitioners therefore need to select the most robust and persistent factors for their normal return model. For the South African equity market, various researchers provide evidence against the use of the CAPM as a normal return model due to the discovery of various anomalies, the failure of market beta to predict returns and the market segmentation of the JSE.

The most common and persistent anomalies on the JSE are size and value effects. In the words of Strugnell, Gilbert and Kruger (2011), value effects are those linked to measures of the stock price being out of line with fundamental indicators of firm value, such as book value of assets or earnings while the size effect speaks to the outperformance of smaller firms, as measured by market capitalisation, in comparison to larger firms. In the literature reviewed in Chapter 3, beginning with the study on CAPM anomalies by van Rensburg

and Robertson (2003b), Auret and Sinclaire (2006), Basiewicz and Auret (2009), Basiewicz and Auret (2010), Hoffman (2012) and Kruger (2014) all find evidence of size and value anomalies.

Further evidence against the CAPM and using a market proxy such as the ALSI for predicting returns comes from van Rensburg and Robertson (2003a). Their study found that the market beta, using the FTSE-JSE All share index as a market proxy, has no predictive power for returns on the JSE and if anything, had an inverse relationship with returns. Strugnell, Gilbert and Kruger (2011) further substantiate these findings in their study and conclude that beta, using the FTSE-JSE All share index as a market proxy, is irrelevant as far as return generation on the JSE is concerned.

In addition to the aforementioned reasons, the CAPM is not suitable for return prediction in South Africa due to the market segmentation of the JSE. Van Rensburg (2002) describes “market segmentation” as the dichotomy in the return generating processes underlying JSE industrial and mining shares. This unique feature of the JSE was announced to South African literature by Gilbertson and Goldberg (1981), who suggested reformulating the market model index to include a mining and an industrial factor. Van Rensburg and Slaney (1997) reformulate the market index and show that a two factor APT Model comprising of the JSE Actuaries All Gold and Industrial indices has explanatory power for many cross-sectional irregularities on the JSE and was more appropriate for pricing assets on the JSE than the CAPM. With the reclassification of the JSE in March 2000, van Rensburg (2002) updated the two factor APT to the *Findi* and *Resi* indices.

At this point, it is quite clear that the study cannot make use of the CAPM or any other model that incorporates a market proxy. The study therefore turns to the findings of van Rensburg (2001) and van Rensburg and Robertson (2003b) and the recommendation of van Rensburg (2001) in selecting a normal return model. As previously stated in the literature review, studies by van Rensburg (2001) and van Rensburg and Robertson (2003b) have both examined the presence of style-based effects on the JSE. While van

Rensburg (2001) found price-to-earnings, market capitalisation and momentum variables to form a parsimonious representation of style-based risk on the JSE, van Rensburg and Robertson (2003a) specified a two-factor style-based model using size and price-to-earnings as explanatory variables for the cross-section of JSE returns. In both studies, these anomalies persisted even after risk-adjustment from the two-factor APT model of van Rensburg and Slaney (1997). In conclusion of his paper, van Rensburg (2001) recommended augmenting the two factor APT model of van Rensburg and Slaney with CAPM anomalies. This study follows this recommendation.

However, while van Rensburg (2001) and van Rensburg and Robertson (2003b) recommend price-to-earnings as a value proxy, South African returns for this risk factor are not readily available. The study therefore uses book-to-market returns as a proxy for value as its returns are readily available in the Peregrine Securities Research South African factor data library. Therefore, the normal return model used in the study augments the two factor APT model of van Rensburg (2002) with size and book-to-market variables forming a normal return model of the *Findi*, the *Resi*, size and book-to-market.

As previously stated, the size and book-to-market factor returns are obtained from the Peregrine Securities Research South African factor data library. Size is simply the market capitalisation value of the stock as at the end of the previous month while the book-to-market ratio is computed by taking the most recent book value six months prior to the current month and dividing it by the market value as at the end of the previous month. The returns to the size and book-to-market variables are then calculated using the two-way portfolio sort approach in the following three steps.

Firstly, all stocks on the FTSE/JSE ALSI index are ranked based on size, using the 50th percentile as breakpoint to create two subsets of stocks: *Big and Small*. The stocks are then independently ranked based on their respective book-to-market scores, using the 30th and 70th percentiles as breakpoints to create three subsets of stocks: *Low, Neutral and High*. Six equal-weighted or cap-weighted portfolios i.e. *Big Low, Big Neutral, Big High, Small Low, Small Neutral and Small High* are created using each size/value pair

depending on the defined breakpoints. Value returns are then calculated as the average return of the two *High* portfolios minus the average return of the *Low* portfolios. Similarly, the size returns are calculated by going long the *Big* portfolios and short the *Small* portfolios.

5.2. Short run performance

The study uses the standard-event study methodology of Fama *et al.* (1969) to calculate returns around announcement dates. The first step in using this methodology is to calculate the so-called Abnormal Return, AR, as the difference between realized and expected returns for each security in the sample at each point in time as shown in Equation 3:

$$AR_{it} = R_{it} - (R_{it}) \qquad (3)$$

Where, R_{it} is the actual return and (R_{it}) is the expected or normal return

Given that the examination of returns to M&A in this section is short-term in nature, this study makes use of daily ARs. The average ARs for each day are then calculated to give Average Abnormal Returns (AARs) for all securities on each day in the event window as shown in Equation 4:

$$AAR_{tt} = 1/N \sum_{i=1}^{N} AR_{it} \qquad (4)$$

.

Lastly, the AARs are summed up for each day in the event window to give the Cumulative Average Abnormal Returns (CAARs) as shown in equation 5:

$$CAAR_t = CAAR_{t-1} + AAR_t \qquad (5)$$

However, to calculate abnormal returns (*i.e.* returns attributable to the event of interest), normal (or expected) returns need to be estimated first. Normal returns are returns that would be expected in the absence of the event of interest. As discussed in Chapter 5.1,

the study makes use of four factors to estimate normal returns for South Africa, *i.e.* the *Findi*, the *Resi*, size and book-to-market. However, daily returns to the size and book-to-market risk factors for the South African equity market are not readily available. The study therefore only uses the *Findi* and the *Resi* as an estimate of short term expected returns.

According to van Rensburg (2002), individual company returns are influenced by either the *Findi* or the *Resi*, but seldom by both. The study therefore matches each firm in the event dataset to the factor (*Findi* or *Resi*) that influences its returns based on whether it is a resource or a non-resource stock. Resource stocks are matched to the *Resi* while non-resource stocks are matched to the *Findi*.

The next step in calculating short-term CAARs is determining the estimation window. An estimation window is the period of trading days before the announcement date that is used to estimate the expected return for each asset and each announcement (Event Study Metrics [ESM], n.d.). While there is no general consensus with respect to the length of the estimation window, most studies use an estimation window of 180 or 200 trading days ending either 10 or 20 days prior to the event (ESM, n.d.). However, the end date of the estimation window should depend on the likelihood of information leakage of the event of interest. In light of the possibility of information leakage in emerging markets reported in Yilmaz and Tanyeri's (2016) study, the estimation window in this study needs to end earlier than the 10 or 20 days used in most studies. ESM (n.d.) finds that M&A event studies often use 40 trading days prior to the M&A announcement as the end date for the estimation window. Consequentially, the study uses a 200-trading day estimation window ending 40 days prior to the event date.

Lastly, this study estimates CAARs over eight event windows. An event window is the period of trading days over which abnormal returns are calculated. The event windows are: (-40,40), (-30,30), (-20,20), (-10,10), (-5,5), (0,10), (0,20) and (0,30). Since many acquirers make multiple acquisitions, there is a possibility that returns from one acquisition will overlap with those from another acquisition resulting in cross-correlation in their returns. Therefore, the Kolari and Pynnönen (2010) test statistic that corrects for

cross-correlation is used in determining the significance of the CAARs. Furthermore, the study takes into consideration thin trading effects on the JSE. Consequentially, for its estimators, the study prefers the Scholes/Williamson estimation method, that corrects for thin trading effects, over the commonly used Ordinary Least Squares.

Figure 2 illustrates and Table 2 reveals announcement date returns for the eight event windows, as well as their p-values. Only the (−5, +5) event window has a significant positive return of 0.0168 (p-value = 0.0082), which is corrected over the 10-day post-announcement window. All other event window CAARs are not significantly different from zero.

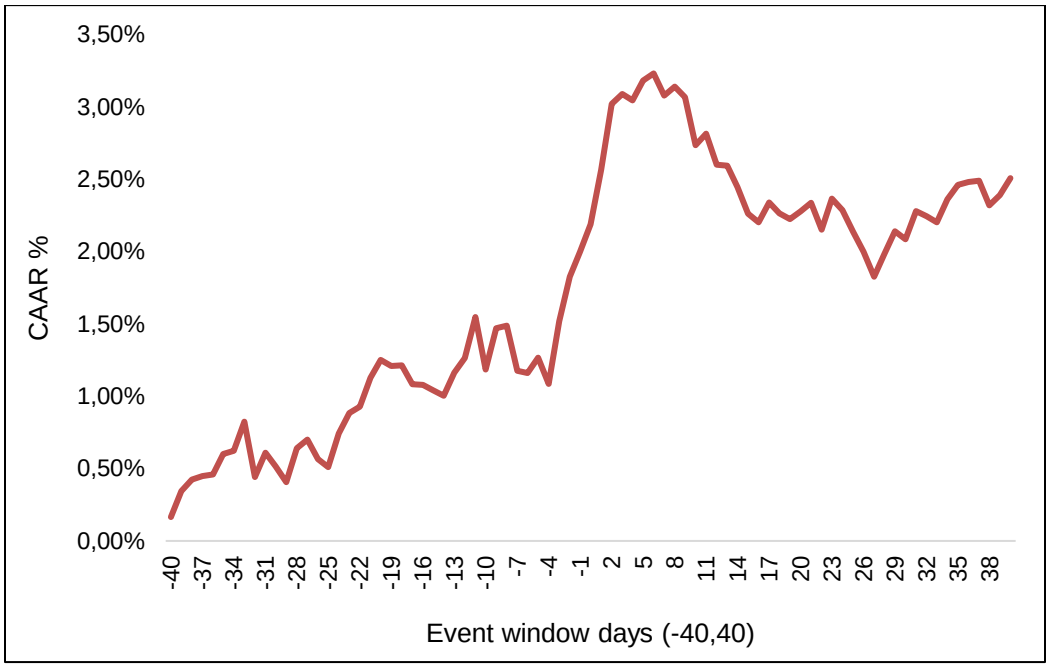

Figure 2. Cumulative Average Abnormal Returns estimated using the two factor APT (*Findi & Resi*).

The constant mean return model, which estimates the mean return of an asset over a period of time (the estimation window) as an estimate of the expected return of the asset, is used to corroborate results from the two-factor APT. As shown in Table 2, the results of the constant mean return model are similar to those of the two-factor APT. When using the constant mean return model, only the (−5, +5) event window has a significant positive

return of 0.0172 (p-value = 0.002). However, the market subsequently corrects for the initial positive reaction to news of the acquisition as CAARs become insignificant within 10 days after the announcement date. Figure 3 illustrates the results from the constant mean return model.

Thus overall, the results from both the constant mean return model and two-factor APT consisting of the *Findi* and the *Resi* indicate that initial overreaction in the South African market is followed rather quickly by a negative correction (i.e. negative abnormal returns) within ten days of the announcement date, and possibly much earlier than the effective date.

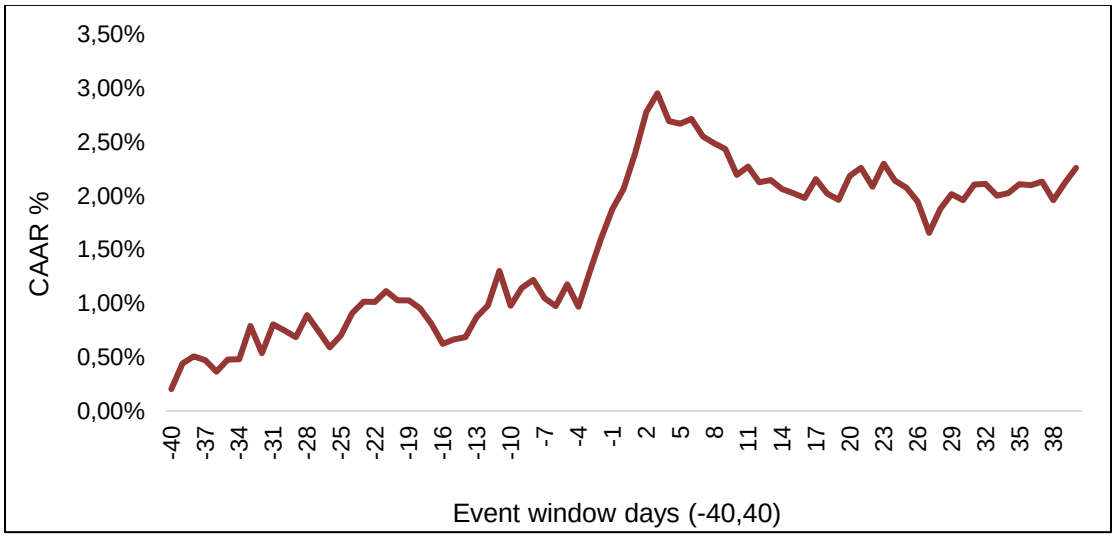

Figure 3. Cumulative Average Abnormal Returns estimated using the constant mean return model.

Table 2. Short-run cumulative abnormal return

	Two-factor APT		Constant mean return model.	
Period	CAAR	P-value	CAAR	P-value
(-40...40)	0.0218	0.2049	0.0089	0.4159
(-30...30)	0.0109	0.4256	0.0018	0.8518
(-20...20)	0.0103	0.3344	0.0027	0.7378
(-10...10)	0.0087	0.2757	0.0063	0.3401
(-5...5)	0.0168	0.0082 ***	0.0172	0.0020 ***
(0...10)	0.0031	0.6092	0.0040	0.4336

(0...20)	0.0029	0.6981	-0.0021	0.7475
(0...30)	0.0005	0.9523	-0.0055	0.4397

The constant mean return model and two-factor APT are used to determine the abnormal return and adjusted abnormal return. The study uses an estimation window of 200 days. While most studies end their estimation windows 10 or 20 days prior to the event, this study is weary of the possibility of information leakage in emerging markets (see Yilmaz and Tanyeri, 2016). The estimation window used in this study therefore ends 40 days prior to the announcement date to account for the possibility of information leakage. Eight event windows are estimated: (-40, 40), (-30, 30), (-20, 20), (-10, 10), (-5, 5), (0, 10), (0, 20) and (0, 30). CAAR is the summation of the average abnormal returns for each stock for a specific event window. The statistical significance of the abnormal return was examined by test statistics introduced by Kolari and Pynnönen (2010) that corrects for cross-sectional correlation in stock returns. This adjustment was necessary since many acquirers make multiple acquisitions. CAAR results are reported in decimals (not in %). *, ** and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

5.3. Long-run performance

The long-run performance of South African acquirers is measured using both the BHAR and CTP approaches. The results from these BHAR and CTP methodologies are determined in sections 5.1.1 and 5.1.2 respectively.

5.3.1. BHAR approach

The BHAR approach estimates abnormal return as the difference between the long-run compounded buy-and-hold return of a sample firm less the long-run compounded return of an appropriate benchmark. The first step in implementing the BHAR approach is determining an appropriate benchmark for abnormal returns. This study considers the three options suggested by Barber and Lyon (1997): a reference portfolio such as the market index, a control firm benchmark, where sample firms are matched to a similar firm on the basis of specified firm characteristics such as size and book-to-market, and an asset pricing benchmark such as the Fama and French three-factor model.

However, using a reference portfolio such as a market index as benchmark yields three biases; the new listing bias, the rebalancing bias and the skewness bias. As discussed in the literature review, the new listing bias arises as a mismatch between sample firms that have long post-merger returns and newly listed firms in the reference portfolio that began trading subsequent to the event month, the rebalancing bias arises since the

compounded returns of a reference portfolio are typically calculated assuming periodic rebalancing while the returns of sample firms are compounded without rebalancing and the skewness bias arises since while it is common to observe a sample firm with an annual return in excess of 100%, it is uncommon to observe a return on the market index in excess of 100%, resulting in skewed abnormal returns (Barber & Lyon, 1997). The skewness bias also leads to Fama's (1998) criticism of using an asset pricing benchmark such as the Fama and French three-factor model. The biases induced by using a reference portfolio approach imply that for the BHAR approach, the study cannot make use of the normal return model described in Chapter 5.1 that comprises of the *Findi*, the *Resi*, size and value factors.

As a solution to the biases that inhibited the use of the reference portfolio approach, Barber and Lyon (1997) proposed the use of the control firm approach, which matches sample firms to control firms of similar size and book-to-market value. The control firm approach yielded well-specified test statistics as it eliminated the new listing bias (since both the sample and control firms must be listed in the event month), the rebalancing bias (since both the sample and control firms' returns are calculated without rebalancing) and the skewness bias (since both the sample and control firms are equally likely to have large positive returns) (Barber & Lyon, 1997).

In pursuit of the most accurate results, the mentioned study applied the more robust control firm approach that matches sample firms against same-industry firms that have similar characteristics, such as firm size and book-to-market values, but did not engage in M&A. However, due to the relatively small size of the JSE in contrast to overseas markets, the control firm approach is not feasible in the South African context. In their study on the long-run M&A performance of German acquirers, Mager and Meyer-Fackler (2017) run into a similar problem. To mitigate this problem, the authors matched each sample firm with its respective industry index. The study therefore takes a similar approach to that of Mager and Meyer-Fackler (2017).

The JSE is classified into ten broad industries; Oil and Gas, Basic Materials, Industrials, Consumer Goods, Health Care, Consumer Services, Telecommunication, Utilities, Financials and Technology. Each firm in the event dataset is therefore matched to its respective industry index over the event window considered for the particular merger or acquisition.

For the BHAR analysis, a skewness- adjusted test statistic is used to mitigate the skewness bias. One-year, two-year and three-year BHARs are -0.0579 (p-value =0.0097), -0.0746 (p-value = 0.0956) and -0.1203 (p-value = 0.0485) per month, respectively. All three years have significant BHARs at the five percent level. These results are reported in Panel A of Table 3 and illustrated in Figure 4.

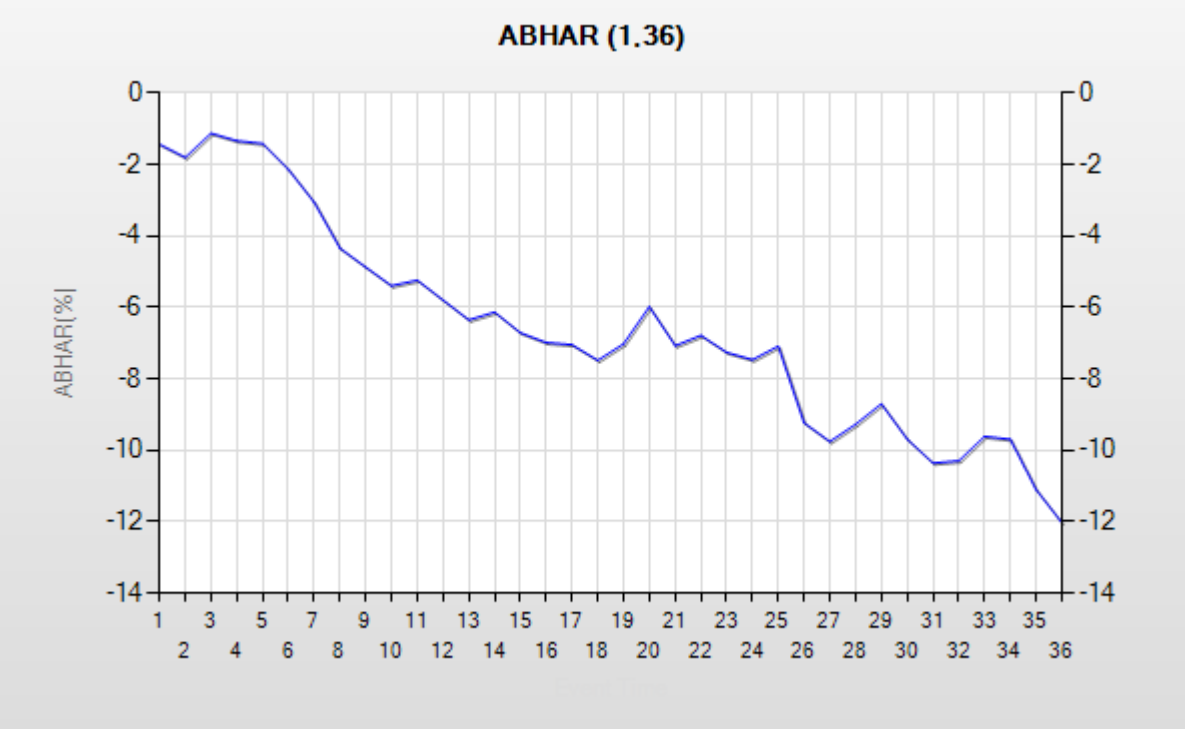

Figure 4. Equal-weighted Buy and Hold Abnormal Returns from the overlapping sample

However, Loughran and Ritter (2000) report that abnormal returns disappear when returns are value-weighted. The study therefore examines value-weighted abnormal returns. Value-weighted BHARs are calculated based on the market value of the acquiring

firm at the effective date of acquisition. The monthly one-year, two-year and three-year value-weighted BHARs for were -0.0413 (p-value = 0.0628), -0.0627 (p-value = 0.1561) and -0.01291 (p-value = 0.0357). The negative BHARs were robust to the value-weighted adjustment over the one and three-year holding periods. Abnormal returns to South African acquirers therefore appear to be negative. These results are reported in Panel A of Table 3 and illustrated in Figure 5.

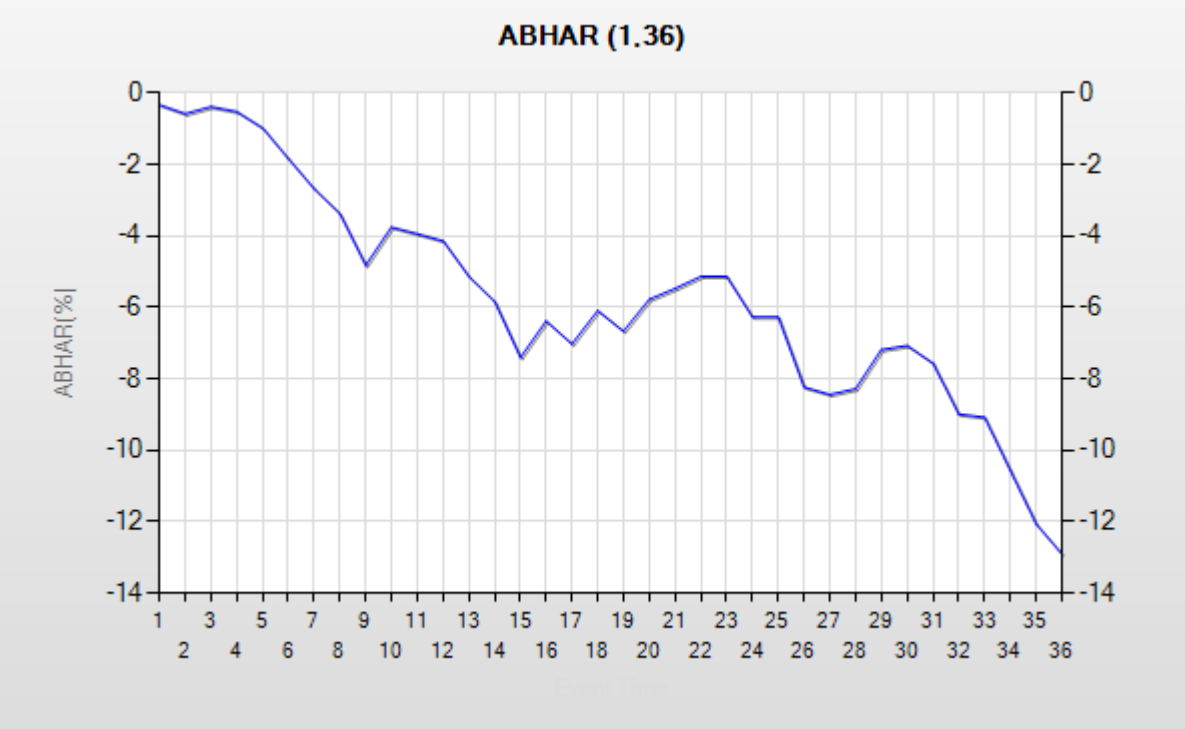

Figure 5. Value-weighted Buy and Hold Abnormal Returns from the overlapping sample

The last adjustment made to enhance the robustness of the findings from the BHAR approach is for cross-correlation. Mitchell and Stafford (2000) suggest that the BHAR approach in its traditional form results in overstated test statistics and an adjustment should be made for positive cross-correlation of individual firm BHARs. In their study, Mitchell and Stafford (2000) found that cross-correlation in returns resulted in overstated test statistics that indicated false significant abnormal returns. Two adjustments are made for cross-correlation. Firstly, the study uses the test statistic proposed by Kolari and Pynnönen (2010) that corrects for cross-correlation. Secondly, only non-overlapping

cases are considered. Any acquisition that occurred within three years of a previously included acquisition by the same firm is excluded from the sample. The adjustment for non-overlapping events results in a final sample of 121 M&A.

For the non-overlapping sample, only value-weighted returns are examined. Using the Kolari and Pynnönen (2010) test statistic, the value-weighted returns to acquirers remain negative but lose their significance, over all holding periods. The value-weighted one-year, two-year and three-year monthly BHARs are 0.0004 (p-value = 0.9893), -0.0269 (p-value = 0.5795) and -0.0283 (p-value = 0.7399), respectively. These results are reported in Panels B of Table 3 and illustrated in Figure 6.

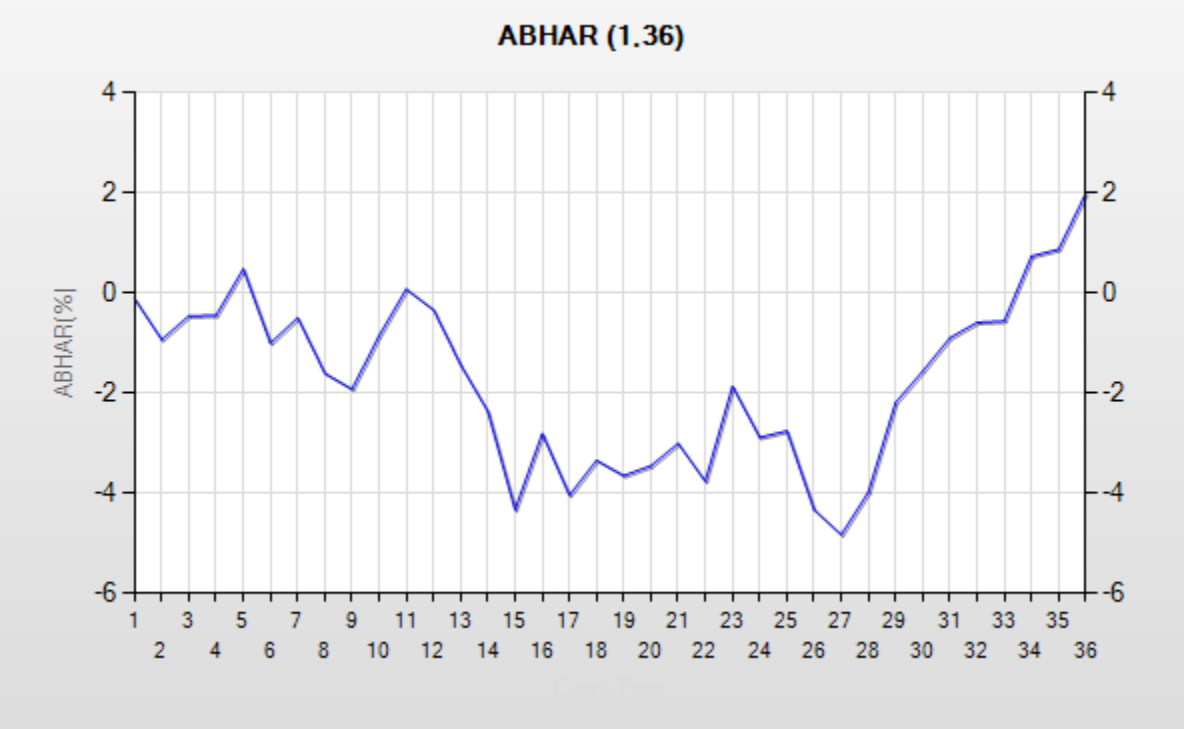

Figure 6. Value-weighted Buy and Hold Abnormal Returns from the non-overlapping sample

At this point, given the robustness measures taken in the non-overlapping sample, there appears to be no evidence of abnormal returns to South African acquirers when using the BHAR approach.

In conclusion of the examination of abnormal returns using the BHAR approach, the non-overlapping sample is separated into two broad groups. These groups are based on the market segmentation of van Rensburg and Slaney (1997) and van Rensburg (2002). In these two studies, it was shown that individual returns of each firm on the JSE are influenced by either the *Findi* or the *Resi* but seldom by both. The study therefore examines returns to firms belonging to industries influenced by the *Resi* separately from those belonging to industries influenced by the *Findi*. These two broad groups are classified as resources stocks and financial and industrial stocks, respectively. Value-weighted returns for both groups are examined using the Kolari and Pynnönen (2010) test statistic that adjusts for cross-correlation in stock returns.

For financial & industrial stocks, one-year, two-year and three-year monthly BHARs are 0.0475 (p-value = 0.1618), 0.0786 (p-value = 0.1732) and 0.0876 (p-value = 0.3034). Interestingly, however, the BHARs for resource stocks are significantly negative. One-year, two-year and three-year monthly BHARs are -0.1679 (p-value = 0.0688), -0.4541 (p-value = 0.0015) and -0.5502 (p-value = 0.0028).

Table 3. BHAR results

Panel A. Overlapping equal-weighted and value-weighted BHARs

Holding period (months)	Equal-weighted BHAR	Value-weighted BHAR
12 months	-0.0579 ***	-0.0413 *
	(0.0097)	(0.0628)
24 months	-0.0746 *	-0.0627
	(0.0956)	(0.1561)
36 months	-0.1203 **	-0.1291 **
	(0.0485)	(0.0357)

Panel B. Non-overlapping value-weighted BHARs

Holding period (months)	Value-weighted BHAR
12 months	-0.0033
	(0.9118)
24 months	-0.0289
	(0.5537)
36 months	0.0200
	(0.7793)

Panel C. Non-overlapping value-weighted BHARs for Financials & Industrials and Resources

Holding period (months)	BHAR- Financials & Industrials	BHAR- Resources
12 months	0.0475	-0.1679 *
	(0.1618)	(0.0688)
24 months	0.0786	-0.4541 **
	(0.1732)	(0.0015)
36 months	0.0876	-0.5502 **
	(0.3034)	(0.0028)

BHAR is the buy-and-hold abnormal return measured as the average difference in the compounded return between a sample firm and a benchmark over a 12, 24 and 36-month holding periods starting after the effective month of acquisition. The study had 204 overlapping cases and 121 non-overlapping cases. If a firm makes acquisitions within three years of a previous acquisition, these acquisitions were considered 'overlapping'. Otherwise, events are considered ''non-overlapping" cases. Value-weight BHAR is calculated based on the market value weight of the acquiring firm at the effective date of acquisition. T-Statistics and adjusted t-statistics are reported. A skewness-adjusted t-statistics accounts for skewness and a Kolari and Pynnönen (2010) test statistic is used to correct for cross-sectional dependence in stock returns. BHAR values are monthly returns expressed in decimals not in percentages. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

5.3.2. CTP approach

To corroborate the findings from the BHAR approach, the study considers the more statistically robust Calendar-Time Portfolio approach. This approach is recommended ahead of the BHAR, primarily due to the cross-correlation in returns from the BHAR approach that results in skewness and non-normality of BHAR returns, therefore hindering statistical inference of BHAR returns.

The CTP method is implemented by calculating returns from a portfolio of firms engaging in M&A. For each calendar month over the entire sample period (2003-2014), a portfolio comprising of all firms that experienced M&A is constructed. Portfolios are rebalanced monthly to drop all companies that reach the end of their holding period (one-year, two-year and three-year holding periods are considered) and add all companies that have just undergone an M&A. According to Mitchell and Stafford (2000), by constructing event portfolios and estimating a time-series of portfolio returns, the cross-sectional correlations of the individual event firm returns are automatically accounted for in the portfolio variance at each point in calendar time. The time series of the monthly returns from the portfolio and the normal return model comprising of the *Findi*, the *Resi*, size and value are used to determine abnormal returns using the following regression:

$$R_{p,t} - R_{r,t} = \alpha_p + \beta(R_{findi,t}-R_{r,t}) + \beta(R_{resi,t}-R_{r,t}) + \beta(SMB_t) + B(HML_t) + e \qquad (3)$$

where,

$R_{p,t}$ is the return on the monthly M&A portfolio,

$R_{r,t}$ is the return on 91-day South African Government Treasury bills,

α_p is the abnormal return,

R_{findi} is the return on the *Findi*,

R_{resi} is the return on the *Resi*,

SMB is the size factor return,

HML is the book-to-market factor return and

β is the loading of the portfolio on each independent variable.

The analysis of the long-run abnormal returns results of South African acquiring firms focuses on the alpha coefficients from the regression. When one-year, two-year and three-year post-acquisitions abnormal returns of South African acquirers are measured, the study finds insignificant positive performance of 0.0008 (p-value=0.7281), 0.00015 (p-value=0.50716) and 0.0021 (p-value=0.339), per month respectively. A small but positive alpha performance signifies that South African acquirers do not destroy shareholder value and, if anything, create shareholder value. However, the robustness of these findings is examined by making three adjustments.

Firstly, the robustness of these results is examined using Weighted Least Squares (WLS) instead of Ordinary Least Squares (OLS). WLS is preferred over OLS for two reasons. Firstly, the criticism of Loughran and Ritter (2000)'s of the CTP approach is considered. According to Loughran and Ritter (2000), the CTP has low power to detect abnormal performance since it weights each time period equally. Any differential abnormal performance in periods of high activity versus periods of low activity will be averaged out by the regression approach making the CTP approach less likely to uncover abnormal performance (Loughran & Ritter, 2000). The WLS procedure allows months with more acquiring firms to be weighted more heavily. Secondly, the WLS deals with potential heteroscedastic residuals induced by the changing portfolio composition, since variance is related to the number of firms in the portfolio. The weights used for the WLS are proportional to the square root of the number of firms present in each calendar time portfolio month. Despite this adjustment, the post-acquisition abnormal returns remain insignificant and largely the same as before with one-year, two-year and three-year post-acquisitions abnormal returns of -0.0006 (p-value=0.8010), 0.0001 (p-value=0.9535) and 0.0011 (p-value=0.6172), per month respectively.

The second adjustment made for more robust results is constructing value-weighted portfolios instead of equal-weighted portfolios. In each monthly portfolio, each company is weighted using by its size, as measured by market capitalization. Value-weighted returns for the size and book-to-value factors are also used in the normal return model. Adjusting for size results in one-year, two-year and three-year post-acquisitions abnormal

returns of -0.0013 (p-value=0.5771), -0.0006 (p-value=0.8026) and 0.0005 (p-value=0.8352). As before, the returns remained largely unchanged with regard to their magnitude and statistical significance. The WLS results from the equal and value-weighted sample are presented in Panels A and B of Table 4.

The third adjustment made is the consideration of non-overlapping M&As. To get better insight into any possible cross-sectional dependence in the results that may arise due to overlapping acquisition events by the same firm, and in-line with studies by Dutta and Jog (2009) and Andre, Kooli and L'Her (2004), non-overlapping events are examined. As with BHARs, any acquisition that occurred within three years of a previously included acquisition by the same firm is excluded from our sample. The WLS one-year, two-year and three-year value-weighted non overlapping abnormal returns are 0.0088 (p-value=0.0226), -0.0018 (p-value=0.3824) and -0.0003 (p-value=0.8627), per month respectively. Similar to the overlapping sample, the one-year, two-year and three-year equal-weighted WLS abnormal returns of 0.0031 (p-value=0.236), -0.0011 (p-value=0.6186) and 0.0005 (p-value=0.7779) are insignificant. The WLS results from the equal and value-weighted non-overlapping sample are presented in Panels A and B of Table 5.

Table 4. CTP WLS results from the overlapping sample

Panel A. WLS results from the equal-weighted overlapping sample

Holding period (months)	Alpha	Findi	Size (SMB)	Value (HML)	Resi	R^2
12	-0.0006	0.5086 ***	0.3816 ***	-0.1195	0.2369 ***	0.6426
	(0.801)	(0.0000)	(0.0022)	(0.1506)	(0.0000)	
24	0.0001	0.5030 ***	0.492 ***	-0.0078	0.2538 ***	0.6481
	(0.9535)	(0.0000)	(0.0000)	(0.9113)	(0.0000)	
36	0.0011	0.5175 ***	0.5140 ***	0.1154 *	0.2325 ***	0.6240
	(0.6172)	(0.0000)	(0.0000)	(0.0971)	(0.0000)	

Panel B. Results from the value-weighted overlapping sample

Holding period (months)	Alpha	Findi	Size (SMB)	Value (HML)	Resi	R^2
12	-0.0013	0.5467 ***	0.1812 **	-0.0979	0.2192 ***	0.645
	(0.5771)	(0.0000)	(0.0393)	(0.1652)	(0.0000)	
24	-0.0006	0.5167 ***	0.2728 ***	0.0126	0.2665 ***	0.6279
	(0.8206)	(0.0000)	(0.0013)	(0.8428)	(0.0000)	
36	0.0005	0.5707 ***	0.3073 ***	0.1166 *	0.2678 ***	0.5926
	(0.8352)	(0.0000)	(0.0003)	(0.0707)	(0.0000)	

A combination of four factors that have been deemed suitable for the South Africa equity market are used to determine abnormal returns. *Findi* and *Resi* refer to the Financial-Industrial and Resources indices respectively. SMB is the difference between the returns of small size firm portfolios and large size firm portfolios while HML is the difference between the returns of value firm portfolios and growth firm portfolios. The Alpha value reported in the regression model indicates the monthly average abnormal return of the sample and is expressed as a decimal and not a percentage. The weighted least squares (WLS) technique is used in which the square root of the number of firms in each month is used as its weight in regression model. Both equal and value-weighted WLS returns are calculated. The number of cases with complete return data for up to three years, used in the analysis to calculate alpha, are 204. Value-weighted returns are calculated using size, as measured by market cap. T-Statistics and significance levels are reported for each factor. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Table 5. CTP WLS results from the non-overlapping sample

Panel A. WLS results from the equal-weighted non overlapping sample

Holding period (months)	Alpha	Findi	Size (SMB)	Value (HML)	Resi	R^2
12	0.0031	0.5685 ***	0.3241 **	0.0657	0.1527 ***	0.5671
	(0.2360)	(0.0000)	(0.0189)	(0.4717)	(0.0001)	
24	-0.0011	0.5973 ***	0.4565 ***	0.0109	0.1953 ***	0.6608
	(0.6186)	(0.0000)	(0.0000)	(1.4421)	(0.0000)	
36	0.0005	0.6291 ***	0.4173 ***	0.1077 *	0.1598 ***	0.6771
	(0.7779)	(0.0000)	(0.0000)	(0.0751)	(0.0000)	

Panel B. WLS results from the value-weighted non overlapping sample.

Holding period (months)	Alpha	Findi	Size (SMB)	Value (HML)	Resi	R^2
12	0.0088 **	0.5375 ***	-0.0914	0.0868	0.1434 **	0.3404
	(0.0226)	(0.0000)	(0.5211)	(0.4484)	(0.0361)	
24	-0.0018	0.6564 ***	0.4203 ***	0.0337	0.2391 ***	0.6761
	(0.3824)	(0.0000)	(0.0000)	(0.5267)	(0.0000)	
36	-0.0003	0.6807 ***	0.4547 ***	0.1041 **	0.2236 ***	0.7029
	(0.8627)	(0.0000)	(0.0000)	(0.0448)	(0.0000)	

A combination of four factors that have been deemed suitable for the South Africa equity market are used to determine abnormal returns. *Findi* and *Resi* refer to the Financial-Industrial and Resources indices respectively. SMB is the difference between the returns of small size firm portfolios and large size firm portfolios while HML is the difference between the returns of value firm portfolios and growth firm portfolios. The Alpha value reported in the regression model indicates the monthly average abnormal return of the sample and is expressed as a decimal and not as a percentage. The weighted least squares (WLS) technique is used in which the square root of the number of firms in each month is used as its weight in regression model. If a firm makes acquisitions within three years of a previous acquisition, the cases were considered overlapping otherwise, events are considered non-overlapping cases. The number of cases with complete return data for up to three years, used in the analysis to calculate alpha, are 121. Both equal and value-weighted WLS returns are calculated. Value-weighted returns are calculated using size, as measured by market capitalisation. T-Statistics and significance levels are reported for each factor. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Lastly, considering the findings from the BHAR approach, returns to resource and financial and industrial acquirers are investigated separately. Specifically, non-overlapping value-weighted WLS returns are estimated for both groups of acquirers. An adjustment is also made to the normal return model: for resource firms, a three-factor model of the *Resi*, size and book-to-market variables is utilized while the *Findi*, size and book-to-market is utilized for financial and industrial acquirers This adjustment is made since, according to van Rensburg (2002), individual firm returns are influenced by either the *Findi* or the *Resi*, but seldom by both.

For financial and industrial acquirers, one-year, two-year and three-year, abnormal returns are 0.0043 (p-value = 0.1881), 0.0041 (p-value = 0.0991) and 0.0034 (p-value =

0.292), per month respectively. Interestingly, the magnitude and significance of the abnormal returns to resource acquirers from the BHAR approach diminish with the CTP approach. Monthly one-year, two-year and three-year, abnormal returns are -0.0065 (p-value = 0.4268), -0.0099 (p-value = 0.1692) and -0.0072 (p-value = 0.2254), respectively. The diminishing of the magnitude and significance of the BHARs is possibly due to the correction of cross-correlation in returns of resource stocks by the CTP approach. The results are presented in Table 6.

From the CTP regressions, the coefficients for the *Findi* and the *Resi* are positive and significant at the 1% level for all our CTP regressions, except for the one-year value-weighted non overlapping sample where the *Resi* was significant at the 5% level. This justifies their inclusion in the model and overall significance in predicting returns in the South African equity market. The coefficient of the size (SMB) variable is positive and significant at least the 5% level in fourteen of the eighteen regressions in the study. This implies, rather surprisingly, that the average size of acquiring firms is small.

Table 6. CTP results from the Financial & Industrial and Resource groups.

Panel A. WLS results from the value-weighted non overlapping Financial & Industrial group

Holding period (months)	Alpha	Findi	Size (SMB)	Value (HML)	R^2
12	0.0043	0.9230 ***	0.1929 *	0.1493 *	0.5213
	(0.1881)	(0.0000)	(0.0771)	(0.0898)	
24	0.0041	0.9563 ***	0.0557	0.1605 **	0.6451
	(0.0991)	(0.0000)	(0.5409)	(0.0142)	
36	0.0034	0.7892 ***	-0.3056 ***	-0.0787	0.5069
	(0.2920)	(0.0000)	(0.0057)	(0.3570)	

Panel B. WLS results from the value-weighted non-overlapping Resources group

Holding period (months)	Alpha	Resi	Size (SMB)	Value (HML)	R^2
12	-0.0065	0.8399 ***	-0.2742	0.0752	0.4428
	(0.4268)	(0.0000)	(0.3654)	(0.8080)	
24	-0.0099	1.0987 ***	-0.1653 ***	0.3773	0.4822
	(0.1682)	(0.0000)	(0.5590)	(0.1478)	
36	-0.0072	1.2235 ***	-0.04277	0.7515 ***	0.5607
	(0.2254)	(0.0000)	(0.8596)	(0.0006)	

A combination of four factors that have been deemed suitable for the South Africa equity market are used to determine abnormal returns. *Findi* and *Resi* refer to the Financial-Industrial and Resources indices respectively. SMB is the difference between the returns of small size firm portfolios and large size firm portfolios, while HML is the difference between the returns of value firm portfolios and growth firm portfolios. For the financial and industrial firms, the *Findi*, size and value factors are used, while for resource stocks, the *Resi*, size and value factors are used. The Alpha value reported in the regression model indicates the monthly average abnormal return of the sample and is expressed as a decimal not percentage. The weighted least squares (WLS) technique is used in which the square root of the number of firms in each month is used as its weight in regression model. If a firm makes acquisitions within three years of a previous acquisition, the cases were considered overlapping otherwise, events are considered non-overlapping cases. The number of cases, with complete return data for up to three years, used in the analysis to calculate alpha are 121. Only value-weighted returns are calculated using size, as measured by market capitalisation. T-Statistics and significance levels are reported for each factor. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

The coefficient of the value (HML) variable is significantly positive in seven of the eighteen regressions, suggesting that most South African acquirers are value acquirers with higher book-to-market values.

Overall, when the equal-weighted results and the more robust value-weighted results for both the overlapping and non-overlapping samples are considered, the study finds no long-term significant alpha or abnormal return. These results are consistent with the short-term positive abnormal return that became insignificant within ten days after announcement dates of M&A. The study therefore concludes that there is no long-run

underperformance of South African acquirers. Next, the effect of various deal-specific factors on long-run abnormal returns to South African acquirers is examined.

5.4. Determinants of long-run performance

In assessing the correlation of various deal-specific characteristics with the long-run abnormal share return performance of South African acquirers, the WLS value-weighted three-year alpha from the CTP non-overlapping sample is preferred. The following characteristics are examined: the method of payment, the listing status of targets, the target's geographical location, the relatedness of the target's industry to the acquirer's, and the percentage of the target acquired. Table 6 presents alphas from the determinants of long-run M&A performance in South Africa.

The method of payment hypothesis of Myers and Majluf (1984) states that firms pay with equity when their stock is overvalued but pay with cash when their stock is undervalued. When this hypothesis is investigated, the study finds, as expected and in line with similar studies by Andre, Kooli and L'Her (2004) and Mager and Meyer-Fackler (2017) that cash acquirers outperform equity acquirers. Cash acquirers have a slight positive monthly alpha of 0.0146 (p-value = 0.0009) while equity acquirers have a smaller and (even at 10%) insignificant monthly alpha of 0.0065 (p-value = 0.223), over a three-year holding period. Although slightly better than equity acquirers, acquirers who use a combination of cash and equity also have a small and at 10% significance level a statistically non-significant monthly alpha of 0.0138 (p-value = 0.1476) over three years.

The study found that acquirers of private targets slightly outperform their counterparts who acquire public targets. Monthly alpha for acquirers of private targets over a three-year holding period was 0.0143 (p-value = 0.0021) while acquirers of public targets generated an alpha of 0.0101 (p-value = 0.0478). Acquirers of subsidiaries had the highest and most significant return, with an alpha of 0.017 (p-value = 0). As expected, the returns to acquirers of private firms are higher return as they purchase assets at a discount since their targets trade in relatively illiquid markets compared to private firms.

Table 7. Abnormal returns to the determinants of long-run M&A performance.

Variables	Alpha over three years	P-value	R^2
Mode of payment:			
Equity	0.0065	0.2230	0.0593
Cash	0.0146	0.0009 ***	0.0547
Cash and Equity	0.0138	0.1476	0.1062
Target's listing status:			
Public	0.0101	0.3705	0.0490
Private	0.0143	0.0021 ***	0.0485
Subsidiary	0.0170	0.0000 ***	0.0448
Country of transaction:			
Cross border	0.0049	0.0915 *	0.5985
Non cross border	0.0024	0.3532	0.5801
Industry relatedness:			
Related activity	0.0041	0.2096	0.4433
Non- related activity	0.0036	0.1805 *	0.5996
Percentage acquired:			
50% or more	0.0146	0.0009 ***	0.0547
Less than 50%	0.0141	0.0049 ***	0.0314

A combination of four factors that have been deemed suitable for the South Africa equity market are used to determine abnormal returns, *i.e.* the *Findi*, the *Resi*, size and book-to-market factors. The Alpha value reported in the regression model indicates the monthly average abnormal return of the sample and is expressed as a decimal, and not as a percentage. The weighted least squares (WLS) technique is used in which the square root of the number of firms in each month is used as its weight in regression model. If a firm makes acquisitions within three years of a previous acquisition, the cases were considered overlapping. Only non-overlapping case are considered. The number of non-overlapping cases, with complete return data for up to three years, used in the analysis to calculate alpha are 121. Only value-weighted WLS returns are calculated. Value-weighted returns are calculated using size, as measured by market capitalisation. T-Statistics and significance levels are reported for each factor. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

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Interestingly, the study also finds support for the internalization theory of Francoeur (2007). The internalization theory states that cross-border M&A may help create value for acquiring firms if such firms tap into their expertise and know-how on international markets. This study finds that South African cross border acquirers, with a positive and significant monthly alpha of 0.0049 (p-value = 0.0915) outperform non-cross border acquirers who earn a positive but statistically not significant monthly alpha of 0.0024 (p-value = 0.3532). While these results directly contradict those of Andre, Kooli and L'Her (2004), they are in-line with the findings of Mager & Meyer-Fackler (2017).

Next, the impact of industry relatedness on long-term share returns to South African acquirers was investigated. According to Andre, Kooli and L'Her (2004), numerous researchers report that conglomerate mergers underperform horizontal or related mergers because managers are not familiar with the target industry. Furthermore, horizontal mergers should benefit from synergies such as economies of scale and a stronger market share. This study finds evidence for these suggestions, as South African conglomerate mergers earned a lower monthly alpha of 0.0036 (p-value=0.1805) and underperformed horizontal mergers, which also earned a positive but statistically not significant monthly alpha of 0.0041 (0.2096).

Lastly, the study examines the difference in returns, if any, to acquirers of 50% or more, versus those who acquire less than 50% of their targets. The study finds this important as an acquisition of 50% of more of targets gives acquirers control. Acquirers of 50% or more of their targets earn a slightly higher alpha of 0.0146 (p-value = 0.0009) than their counterparts who acquire less than 50%, and earn an alpha of 0.0141 (p-value = 0.0049). This suggests that perhaps gaining control in M&A transactions may not necessarily yield a higher premium for South African acquirers. In the next chapter, the study is concluded with a discussion of the results and the implications these results have for South African firms considering M&A as a corporate strategy.

Chapter 6: Analysis and Conclusion

This study examined the long-run performance of Mergers and Acquisitions (M&A) in South Africa. This has required not only an empirical evaluation of long-run performance of M&A, but also an investigation into various deal characteristics that play a role in determining long-run M&A performance. The study also briefly investigated the short-run performance of M&A. This chapter follows the same three broad categories as have been used throughout this paper: 1) short-run performance; 2) long-run performance; and 3) possible determinants of long-run performance.

Although this study focuses on the long-run performance of M&A in South Africa, the short-run performance is briefly considered. As the short-run performance is an indicator of investors' expectations of M&A deals, it is relevant to determine whether these expectations manifest in the long-run. The study uses the standard-event study methodology of Fama et al. (1969) to calculate Cumulative Average Abnormal Returns (CAARs) around M&A announcement dates. In determining a suitable benchmark for the abnormal returns, attention is paid to the dichotomy in the return generating process between resource stocks and non-resource stocks on the JSE. Consequently, the two-factor APT of van Rensburg (2002), which comprises of the JSE's Financial-Industrial (Findi) and Resources (Resi) indices, was used as a benchmark for expected returns. The study found significant positive abnormal share return performance in the (-5, 5) event window. However, the market corrects for this initial positive reaction to M&A announcements as the CAARs become insignificant within 10 days of the announcement. The robustness of these findings is corroborated using the constant mean return model as a proxy for expected returns. Using the constant mean return model as a benchmark for abnormal returns did not change the conclusions reached with the two-factor APT.

Regarding the long-run performance of M&A and other corporate actions such as share buy backs and Initial Public Offerings (IPOs), two issues have drawn considerable interest: the methodologies used to estimate abnormal returns and the appropriate benchmarks for normal or expected returns. Although initial studies on corporate actions used the CAAR approach of Fama et al (1969), the Buy-and-Hold Abnormal Return

(BHAR) and the Calendar Time Portfolio (CTP) approaches have been preferred in more recent studies. This study employs both approaches, although the results from the CTP approach are preferred as it is considered more statistically robust.

Beginning with the BHAR approach, abnormal return is estimated as the difference between the long-run compounded buy-and-hold return of a sample firm less the long-run compounded return of an appropriate benchmark. Barber and Lyon (1997) suggest that the appropriate benchmark for the BHAR approach is the control firm approach, which matches sample firms to control firms of similar size and book-to-market value. However, given the relatively small size of the JSE, this approach was found to be inappropriate for the study The authors take a similar approach to that employed by Mager and Meyer-Fackler (2017), who run into a similar problem, and match each individual firm to its respective JSE industry index.

Initial returns from the BHAR approach are significantly negative, at least at the 10% level. The direction, magnitude and significance of these results persists even when value-weighted returns are calculated instead of equal-weighted returns. However, according to Mitchell and Stafford (2000), due to positive cross-correlation in returns, the BHAR approach provides overstated test statistics which in turn provide false evidence of abnormal returns. As such, two robustness checks are applied to correct for any cross-correlation. Firstly, the study uses the test statistic proposed by Kolari and Pynnönen (2010) that corrects for cross-correlation. Secondly, only non-overlapping cases are considered. Any acquisition that occurred within three years of a previously included acquisition by the same firm is excluded from the sample. The significance of the initial returns disappears after these adjustments.

Due to the dichotomy in the return generating process between resource stocks and non-resource stocks on the JSE, the non-overlapping sample of each group is investigated separately using value-weighted returns and the Kolari and Pynnönen (2010) test statistic that corrects for cross-correlation. Interestingly, while Financial and Industrial stocks (non-resource stocks) had insignificant returns, resource stocks had negative and significant

returns. The results from the BHAR approach are corroborated with the more robust CTP approach, which adjusts for positive cross-correlation in results.

Under the CTP approach, a portfolio is constructed each calendar month. This portfolio comprises of all firms that experienced M&A during the particular month. Monthly portfolios are constructed over the entire sample period (2003-2014) and are rebalanced monthly to drop all companies that reach the end of their holding period (one-year, two-year and three-year holding periods are considered for the CTP approach) and add all companies that have just undergone an M&A. The resulting time series of monthly returns from the portfolio is regressed on the normal return model comprising of a combination of factors deemed appropriate for the South African equity market to determine abnormal returns. These factors are the *Findi*, the *Resi*, size and value.

Initial results from the CTP approach indicate positive but non-significant abnormal returns. However, similar to the BHAR approach, three adjustments are made for robustness. Firstly, for the CTP regression, Weighted Least Squares (WLS) are preferred to Ordinary Least Squares (OLS) to weight each calendar month with the number of firms in its portfolio. Secondly, value-weighted returns are preferred to equal-weighted returns and thirdly, only non-overlapping cases are considered to correct for any cross-correlation in returns. These adjustments result in negative but insignificant abnormal returns. Furthermore, the returns to Financial and Industrial stocks (non-resource stocks) and resource stocks are investigated separately. Interestingly, the magnitude and significance of the abnormal returns to resource acquirers seen under the BHAR approach diminishes with the CTP approach. Returns to the Financial and Industrial stocks remain insignificant as with the BHAR approach.

Lastly, the study examined the potential deal characteristics that could play a role in explain the long-run performance of South African acquirers. Deal characteristics were examined using the CTP approach and the value-weighted three-year alpha (abnormal return) from non-overlapping sample. Five characteristics are examined; the method of payment, the listing status of targets, the target's nation, the relatedness of the target's

industry to the acquirer's and the percentage of the target acquired. Findings from the study substantiate initial theories on the impact of different deal characteristics on long-run M&A performance.

The study finds that cash acquirers outperform equity acquirers and therefore further substantiates the method of payment hypothesis of Myers and Majluf (1984), which states that firms pay with equity when their stock is overvalued but pay with cash when their stock is undervalued. With regards to returns to acquiring private versus public targets, returns to acquirers of private firms are higher return than those of public targets. This could be explained by the illiquidity discount of purchasing firms in relatively illiquid private markets compared to public markets. There is also evidence for the internalization theory of Francoeur (2007). According to the internalization theory, cross-border M&A may help create value for acquiring firms if such firms tap into their expertise and know how on international markets. The study thus finds that cross-border acquirers outperform non cross-border acquirers. With respect to industry relatedness, according to Andre, Kooli and L'Her (2004), numerous researchers suggest that conglomerate mergers underperform horizontal or related mergers because managers are not familiar with the target industry and the synergies in horizontal mergers. The study finds support for this hypothesis as conglomerate mergers underperformed horizontal mergers. Lastly, the significance of acquiring control in M&A was investigated. The study found M&A that resulted in gaining control slightly outperformed those in which control was not gained.

This study was motivated by the paradox posed by Brouthers, van Hastenburg and van den Ven (1998): If the empirical evidence suggests that M&A fail in the long-run, why do they remain a popular expansion strategy for companies? While South African firms are increasingly making use of M&A as a corporate strategy, it was unclear whether M&A created any value for shareholders. Overall, using the most robust methodologies and normal return benchmarks suitable for the South African equity market, the study does not find any significant abnormal return to South African M&A indicating that M&A do not deliver any statistically significant short- or long-term value to shareholders. This implies that South African firms using M&A should do so with caution.

Appendix A: Full overlapping event list

Date Effective	Acquirer Name	Target Name
1/22/2003	Santam Ltd	Westminster Motor Insurance Association Ltd
5/5/2003	Harmony Gold Mining Co Ltd	Abelle Ltd
5/6/2003	Harmony Gold Mining Co Ltd	Abelle Ltd
9/22/2003	Harmony Gold Mining Co Ltd	African Rainbow Minerals Gold Ltd
4/26/2004	Anglogold Ltd	Ashanti Goldfields Co Ltd
8/18/2003	Growthpoint Properties Ltd	Primegro Properties Ltd
1/1/2004	Mvelaphanda Resources Ltd	Gold Fields Ltd
9/12/2003	Impala Platinum Holdings Ltd	Zimbabwe Platinum Mines Ltd
7/31/2003	Harmony Gold Mining Co Ltd	Avgold Ltd
9/30/2003	Ellerine Holdings Ltd	Wetherlys Investment Holdings Ltd
12/17/2003	AECI Ltd	Chemical Services Ltd {Chemserve}
10/9/2003	Nedbank Ltd	SND Investments Holdings Ltd
12/12/2003	Edgars Consolidated Stores Ltd	Boardmans
5/11/2004	Harmony Gold Mining Co Ltd	Avgold Ltd
5/11/2004	Harmony Gold Mining Co Ltd	Avgold Ltd
3/31/2004	Barloworld Ltd	Avis Southern Africa Ltd
12/5/2003	Brimstone Investment Corp Ltd	Sea Harvest Corp (Pty) Ltd
3/31/2004	Kagiso Media Ltd	Jacaranda FM(Pty)Ltd
8/6/2004	The Bidvest Group Ltd	BIDvest PLC
7/13/2004	Aspen Pharmacare Holdings Ltd	Fine Chemicals Corp(Pty)Ltd
6/18/2004	Harmony Gold Mining Co Ltd	Abelle Ltd
8/2/2004	The Bidvest Group Ltd	BIDCorp Plc
7/2/2004	AngloGold Ashanti Ltd	Trans-Siberian Gold PLC
6/1/2005	AngloGold Ashanti Ltd	Trans-Siberian Gold PLC
11/11/2004	Murray & Roberts Holdings Ltd	Clough Ltd
8/31/2004	Allied Technologies Ltd	Econet Wireless Group
10/6/2004	Johnnies Industrial Corp Ltd	Fabcos Investment Holdings Co Ltd
5/10/2005	Liberty Group Ltd	Capital Alliance Holdings Ltd
12/2/2004	Growthpoint Properties Ltd	Paddocks Shopping Centre
2/1/2005	Growthpoint Properties Ltd	Tresso Trading 199 Pty Ltd- Property Portfolio
4/1/2005	Super Group Ltd	SMB Fleet Management Pty Ltd
9/9/2005	Hyprop Investments Ltd	S A Retail Properties Ltd
9/13/2005	The Bidvest Group Ltd	Deli XL BV
12/8/2005	Sanlam Ltd	African Life Assurance Co Ltd {Aflife}
11/11/2005	Murray & Roberts Holdings Ltd	Clough Ltd

11/11/2005	Murray & Roberts Holdings Ltd	Clough Ltd
11/30/2005	Barloworld Ltd	Avis Biludlejning
3/2/2006	Gold Fields Ltd	Bolivar Gold Corp
1/3/2006	Absa Group Ltd	Barclays National Bank-South Africa
7/20/2006	Barloworld Ltd	Wattyl Ltd
2/16/2006	Imperial Holdings Ltd	Lex Commercials Ltd
2/20/2006	Gold Fields Ltd	Sino Gold Ltd
9/19/2006	Sun International Ltd	Real Africa Holdings Ltd
8/1/2006	Tiger Brands Ltd	Bromor Foods(Pty)Ltd
5/1/2006	MTN Group Ltd	MTN Cote D'Ivoire SA
9/14/2006	MTN Group Ltd	Investcom LLC
5/6/2006	Naspers LTD	Abril SA
7/6/2006	MTN Group Ltd	MTN Uganda Ltd
8/23/2006	Caxton & CTP Publishers & Printers Ltd	Johnnic Communications Ltd
9/4/2006	Cadiz Holdings Ltd	African Harvest Fund Managers (Pty)Ltd
8/28/2006	Esor Ltd	Franki South Africa(Pty)Ltd
9/6/2006	Metorex Ltd	Barberton Mines Ltd
12/1/2006	Gold Fields Ltd	Barrick Gold South Africa(Pty) Ltd
4/10/2007	Gold Fields Ltd	Western Areas Ltd
6/26/2007	AngloGold Ashanti Ltd	OOO GRK Amikan
10/1/2006	Gijima AST Group	AST Distribution Technology (Pty)Ltd
10/18/2006	MTN Group Ltd	MTN Nigeria Communications Ltd
4/26/2007	Aquarius Platinum Ltd	Aquarius Platinum (South Africa) (Pty) Ltd
2/20/2007	Group Five Ltd	Quarry Cats
12/4/2006	Datatec Ltd	CSF Solutions Ltd
4/19/2007	SA Corporate Real Estate Fund	S A Retail Properties Ltd
1/23/2007	Naspers LTD	Mail.Ru
2/7/2007	Afrimat Ltd	Malans Quarries(Pty)Ltd
2/23/2007	Telkom SA Ltd	Africa Online Inc
5/14/2007	Impala Platinum Holdings Ltd	African Platinum PLC
10/1/2008	Exxaro Resources Ltd	Namakwa Sands(Pty)Ltd
3/22/2007	Telkom SA Ltd	Multi-Links Telecommunications Ltd
3/27/2007	Emira Property Fund Ltd	Freestone Property Holdings Ltd
7/16/2007	York Timber Organisation Ltd	Global Forest Products(Pty)Ltd
5/3/2007	Datatec Ltd	Crane Telecommunications Group Ltd
4/26/2007	Aquarius Platinum Ltd	Aquarius Platinum (South Africa) (Pty) Ltd
5/8/2007	The Bidvest Group Ltd	Angliss Singapore Pte Ltd
7/9/2007	Group Five Ltd	Sky Sands (Pty) Ltd
9/1/2007	AngloGold Ashanti Ltd	Iduapriem Mines
12/1/2007	Naspers LTD	Gadu-Gadu SA

1/30/2008	Vox Telecom Ltd	Storm Telecom
3/6/2008	Aspen Pharmacare Holdings Ltd	Strides Latina
11/21/2007	Purple Capital Ltd	Global Trader Ltd
12/31/2007	Aspen Pharmacare Holdings Ltd	Onco Therapies Ltd
1/28/2008	Metorex Ltd	Copper Resources Corp
12/7/2007	Metorex Ltd	Phoenix Platinum Mining Ltd
7/1/2008	AngloGold Ashanti Ltd	Golden Cycle Gold Corp
1/29/2008	Hudaco Industries Ltd	Astore Africa (Pty)Ltd
6/4/2008	Aquarius Platinum Ltd	Platinum Mile Resources (Pty) Ltd
5/30/2008	Sanlam Ltd	Principal Investment Holdings Ltd
3/26/2008	Liberty Group Ltd	Fountainhead Property Trust
4/10/2008	Sanlam Ltd	Buckles Investment Services Ltd
4/30/2008	Metorex Ltd	Copper Resources Corp
5/22/2008	Gold Fields Ltd	Sino Gold Mining Ltd
7/18/2008	Standard Bank Group Ltd	Liberty Holdings Ltd
12/15/2008	AngloGold Ashanti Ltd	Sao Bento Gold Ltd
12/1/2008	O-Line Holdings Ltd	Armco
9/22/2008	Esor Ltd	Patula Construction (Pty)Ltd
9/22/2008	Afrocentric Investment Corp Ltd	Lethimvula Investments Ltd
12/31/2008	Sappi Ltd	M-real Corp-Coated Graphic Paper Business
9/30/2008	Remgro Ltd	PG Group
3/24/2009	African Rainbow Minerals Ltd	TEAL Exploration & Mining Inc
1/21/2009	Telkom SA Ltd	Multi-Links Telecommunications Ltd
1/29/2009	Absa Group Ltd	Pinnacle Point Holdings (Pty) Ltd
1/29/2009	Absa Group Ltd	Blue Financial Services Ltd
7/30/2009	Aquarius Platinum Ltd	Ridge Mining PLC
3/17/2009	Simmer & Jack Mines Ltd	AngloGold Ashanti Ltd-Tau Lekoa Mine
3/2/2009	Distell Group Ltd	Pernod Ricard SA-Bisquit Cognac Brand
10/7/2009	Standard Bank Group Ltd	Investitsionnaya Kompaniya Troyka Dialog ZAO
8/5/2009	Growthpoint Properties Ltd	Orchard Industrial Property Fund
4/16/2010	Nedbank Group Ltd	Imperial Bank Ltd
11/2/2009	Remgro Ltd	VenFin Ltd
10/15/2009	AngloGold Ashanti Ltd	Moto Goldmines Ltd
9/29/2009	The Bidvest Group Ltd	NOWACO Czech Republic sro
10/1/2009	Allied Technologies Ltd	Kenya Data Networks Ltd
9/28/2009	Naspers LTD	BuscaPe.com Inc
10/1/2009	Datatec Ltd	Datastor(NZ)Ltd
7/1/2010	Grand Parade Investments Ltd	Tatts Group Ltd-Gaming Operations

4/14/2010	Adcock Ingram Holdings Ltd	Ayrton Drug Manufacturing Ltd
12/3/2009	Standard Bank Group Ltd	Casa do Pao de Queijo Ltda
1/15/2010	Datatec Ltd	NetStar Group Holding Ltd
4/19/2010	SA Corporate Real Estate Fund	Old Mutual Triangle Warehouse
3/30/2010	Sycom Property Fund	Tyger Hills Office Park (Pty) Ltd
3/1/2010	Santova Logistics Ltd	Aviocean(Pty)Ltd
8/27/2010	Redefine Properties Ltd	Hyprop Investments Ltd
1/31/2011	Aspen Pharmacare Holdings Ltd	Sigma Pharmaceuticals Ltd- Pharmaceutical Division
5/13/2011	Hospitality Property Fund Ltd	Arabella South Africa Holdings (Pty)Ltd-Hotels (2)
1/3/2011	FirstRand Ltd	Barnard Jacobs Mellet Holdings Ltd
8/31/2013	Hudaco Industries Ltd	Filter & Hose Solutions (Pty) Ltd
9/1/2010	Santam Ltd	Indwe Broker Holdings Group Ltd
11/30/2010	Imperial Holdings Ltd	CIC Holdings Ltd
9/8/2010	Business Connexion Group Ltd	Business Connexion(Pty)Ltd
10/7/2010	Datatec Ltd	Westcon Group Inc
11/30/2013	Hudaco Industries Ltd	Global Communications Network
3/28/2011	Capital Property Fund Ltd	Pangbourne Properties Ltd
9/1/2011	Hyprop Investments Ltd	Attfund Retail Ltd
5/11/2011	Business Connexion Group Ltd	UCS Solutions Holdings (Pty)Ltd ,CEB Maintenance Africa(Pty),L
3/1/2011	Sasol Ltd	Talisman Energy Inc-Farrell Creek Shale Gas Assets
12/22/2010	The Bidvest Group Ltd	Seafood Holdings Ltd
10/2/2012	Sanlam Ltd	Shriram Capital Ltd
3/18/2011	Steinhoff International Holdings Ltd	Conforama SA
1/6/2012	Keaton Energy Holdings Ltd	Leeuw Mining & Exploration (Pty) Ltd
5/31/2011	Tiger Brands Ltd	Davita Trading (Pty)Ltd
6/10/2011	Sasol Ltd	Talisman Energy Inc-Cypress A Assets,British Columbia
6/22/2011	Gold Fields Ltd	Gold Fields Ltd-Tarkwa & Damang Gold Mines
6/9/2011	Resilient Property Income Fund Ltd	The Grove, Pretoria
9/30/2011	AngloGold Ashanti Ltd	First Uranium Corp
12/1/2011	Resilient Property Income Fund Ltd	Boardwalk Shopping Centre
3/12/2012	Rainbow Chicken Ltd	Bush Valley Chickens
8/8/2012	PBT Group Ltd	Prescient Capital (Pty)Ltd
6/30/2013	ARB Holdings Ltd	Eurolux (Pty) Ltd
10/27/2011	Tiger Brands Ltd	National Foods Holdings Ltd

3/14/2012	Sun International Ltd	Real Africa Holdings Ltd
3/15/2012	Afrimat Ltd	Clinker Supplies (Pty)Ltd
1/30/2012	Steinhoff International Holdings Ltd	PSG Group Ltd
4/20/2012	Steinhoff International Holdings Ltd	JD Group Ltd
2/3/2014	Anglo American Platinum Ltd	Atlatsa Resources Corp- Boikgantsho Project,Ga-Phasha Project
3/1/2012	AVI Ltd	Green Cross Manufacturers (Pty)Ltd
8/7/2012	AngloGold Ashanti Ltd	First Uranium (Pty)Ltd
7/25/2012	Redefine Properties Ltd	Southcoast Mall
6/28/2012	AngloGold Ashanti Ltd	Gold Mine,Crixas,GO
6/13/2012	Hudaco Industries Ltd	Keys Makin Plastics (Pty)Ltd, Quality Compounding (Pty)Ltd
6/27/2012	AECI Ltd	General Electric Co-Chemical & Monitoring Solutiions Business
10/4/2012	Tiger Brands Ltd	Dangote Flour Mills Plc
10/1/2012	Mondi Ltd	Nordenia International AG
7/25/2012	Pretoria Portland Cement Co Ltd	Habesha Cement Share Co
8/21/2012	Imperial Holdings Ltd	RTT Group (Pty)Ltd-RTT Health Services
11/7/2012	AECI Ltd	Black Bear Resources Indonesia PT
4/29/2013	Rainbow Chicken Ltd	Capitau Investment Management Ltd
7/2/2013	The Bidvest Group Ltd	Amalgamated Appliance Holdings Ltd {AMAP}
12/4/2012	Consolidated Infrastructure Group Ltd	AES Angola Environmental Servicos Lda
4/1/2013	Tiger Brands Ltd	Ball's Chutney Pty Ltd
12/12/2012	PPC Ltd	Cimerwa Ltd
1/25/2013	Adcorp Holdings Ltd	Paxus Australia Pty Ltd
1/24/2013	Netcare Ltd	General Healthcare Group PLC
4/1/2013	Rainbow Chicken Ltd	Zam Chick Ltd
10/1/2013	Hyprop Investments Ltd	Somerset Mall
4/12/2013	Distell Group Ltd	Burn Stewart Distillers Ltd
4/26/2013	Raubex Group Ltd	Tosas Holdings (Pty)Ltd
4/28/2013	Aspen Pharmacare Holdings Ltd	Nestle SA-Infant Nutritional Business,Australia
6/12/2014	Nedbank Group Ltd	Banco Unico SA
10/1/2013	Aspen Pharmacare Holdings Ltd	NV Organon-Active Pharmaceutical Ingredients Manufacturing B
7/1/2013	Delta Property Fund Ltd	Atterbury Parkdev Consortium (Pty)Ltd
12/11/2013	Murray & Roberts Holdings Ltd	Clough Ltd
12/13/2013	PPC Ltd	Safika Cement Holdings (Pty)Ltd
10/17/2013	Resilient Property Income Fund Ltd	Arbour Town (Pty)Ltd

10/1/2013	Gold Fields Ltd	Barrick Gold Corp-Yilgarn South Assets
2/7/2014	Keaton Energy Holdings Ltd	Xceed Resources Ltd
10/31/2013	Adcorp Holdings Ltd	Labour Solutions Australia
12/1/2013	Hudaco Industries Ltd	Dosco Precision Hydraulics Pty Ltd
3/1/2014	Growthpoint Properties Ltd	Tiber Property Group (Pty)Ltd
4/30/2014	Vodacom Group Ltd	Vodacom Tanzania Ltd
11/5/2014	Vukile Property Fund Ltd	Synergy Income Fund Ltd
2/28/2014	Naspers LTD	Neralona Investments Ltd
8/31/2014	Redefine Properties Ltd	Annuity Properties Ltd
5/21/2014	Steinhoff International Holdings Ltd	JD Group Ltd
8/1/2014	Woolworths Holdings Ltd	David Jones Ltd
4/14/2014	Growthpoint Properties Ltd	Acucap Properties Ltd
4/14/2014	Growthpoint Properties Ltd	Sycom Property Fund
9/1/2014	Resilient Property Income Fund Ltd	Jubilee Mall
9/1/2014	Octodec Investments Ltd	Premium Properties Ltd
12/1/2014	Sun International Ltd	San Francisco Investment SA
8/5/2014	Liberty Holdings Ltd	Liberty Health Holdings Pty Ltd
7/10/2014	The Bidvest Group Ltd	DAC Distribuzione Alimentari Convenienze SpA
11/30/2014	Hudaco Industries Ltd	Partquip Group (Pty) Ltd
9/30/2014	Afrocentric Investment Corp Ltd	Pharmacy Direct (Pty) Ltd,Curasana (Pty) Ltd
11/5/2014	PPC Ltd	Habesha Cement Share Co
11/10/2014	Discovery Ltd	Prudential Health Ltd

Appendix B: Full non-overlapping event list

Date Effective	Acquirer Name	Target Name
1/22/2003	Santam Ltd	Westminster Motor Insurance Association Ltd
5/5/2003	Harmony Gold Mining Co Ltd	Abelle Ltd
8/18/2003	Growthpoint Properties Ltd	Primegro Properties Ltd
9/12/2003	Impala Platinum Holdings Ltd	Zimbabwe Platinum Mines Ltd
9/30/2003	Ellerine Holdings Ltd	Wetherlys Investment Holdings Ltd
10/9/2003	Nedbank Ltd	SND Investments Holdings Ltd
12/5/2003	Brimstone Investment Corp Ltd	Sea Harvest Corp (Pty) Ltd
12/12/2003	Edgars Consolidated Stores Ltd	Boardmans
12/17/2003	AECI Ltd	Chemical Services Ltd {Chemserve}
1/1/2004	Mvelaphanda Resources Ltd	Gold Fields Ltd
3/31/2004	Kagiso Media Ltd	Jacaranda FM(Pty)Ltd
3/31/2004	Barloworld Ltd	Avis Southern Africa Ltd
4/26/2004	Anglogold Ltd	Ashanti Goldfields Co Ltd
7/13/2004	Aspen Pharmacare Holdings Ltd	Fine Chemicals Corp(Pty)Ltd
8/2/2004	The Bidvest Group Ltd	BIDCorp Plc
8/31/2004	Allied Technologies Ltd	Econet Wireless Group
10/6/2004	Johnnies Industrial Corp Ltd	Fabcos Investment Holdings Co Ltd
11/11/2004	Murray & Roberts Holdings Ltd	Clough Ltd
4/1/2005	Super Group Ltd	SMB Fleet Management Pty Ltd
5/10/2005	Liberty Group Ltd	Capital Alliance Holdings Ltd
9/9/2005	Hyprop Investments Ltd	S A Retail Properties Ltd
12/8/2005	Sanlam Ltd	African Life Assurance Co Ltd {Aflife}
1/3/2006	Absa Group Ltd	Barclays National Bank-South Africa
2/16/2006	Imperial Holdings Ltd	Lex Commercials Ltd
2/20/2006	Gold Fields Ltd	Sino Gold Ltd
5/1/2006	MTN Group Ltd	MTN Cote D'Ivoire SA
5/6/2006	Naspers LTD	Abril SA
8/1/2006	Tiger Brands Ltd	Bromor Foods (Pty)Ltd
8/23/2006	Caxton & CTP Publishers & Printers Ltd	Johnnic Communications Ltd
8/28/2006	Esor Ltd	Franki South Africa (Pty)Ltd
9/4/2006	Cadiz Holdings Ltd	African Harvest Fund Managers (Pty)Ltd
9/6/2006	Metorex Ltd	Barberton Mines Ltd
9/19/2006	Sun International Ltd	Real Africa Holdings Ltd
10/1/2006	Gijima AST Group	AST Distribution Technology (Pty)Ltd
12/4/2006	Datatec Ltd	CSF Solutions Ltd
2/7/2007	Afrimat Ltd	Malans Quarries (Pty)Ltd
2/20/2007	Group Five Ltd	Quarry Cats
2/23/2007	Telkom SA Ltd	Africa Online Inc
3/27/2007	Emira Property Fund Ltd	Freestone Property Holdings Ltd

4/19/2007	SA Corporate Real Estate Fund	S A Retail Properties Ltd
4/26/2007	Aquarius Platinum Ltd	Aquarius Platinum (South Africa) (Pty) Ltd
4/26/2007	Aquarius Platinum Ltd	Aquarius Platinum (South Africa) (Pty) Ltd
5/3/2007	Datatec Ltd	Crane Telecommunications Group Ltd
5/14/2007	Impala Platinum Holdings Ltd	African Platinum PLC
6/26/2007	AngloGold Ashanti Ltd	OOO GRK Amikan
7/16/2007	York Timber Organisation Ltd	Global Forest Products (Pty)Ltd
11/21/2007	Purple Capital Ltd	Global Trader Ltd
12/31/2007	Aspen Pharmacare Holdings Ltd	Onco Therapies Ltd
1/29/2008	Hudaco Industries Ltd	Astore Africa (Pty)Ltd
1/30/2008	Vox Telecom Ltd	Storm Telecom
7/18/2008	Standard Bank Group Ltd	Liberty Holdings Ltd
9/22/2008	Afrocentric Investment Corp Ltd	Lethimvula Investments Ltd
9/30/2008	Remgro Ltd	PG Group
10/1/2008	Exxaro Resources Ltd	Namakwa Sands (Pty)Ltd
12/31/2008	Sappi Ltd	M-real Corp-Coated Graphic Paper Business
1/29/2009	Absa Group Ltd	Pinnacle Point Holdings (Pty) Ltd
1/29/2009	Absa Group Ltd	Blue Financial Services Ltd
3/2/2009	Distell Group Ltd	Pernod Ricard SA-Bisquit Cognac Brand
3/17/2009	Simmer & Jack Mines Ltd	AngloGold Ashanti Ltd-Tau Lekoa Mine
3/24/2009	African Rainbow Minerals Ltd	TEAL Exploration & Mining Inc
8/5/2009	Growthpoint Properties Ltd	Orchard Industrial Property Fund
9/28/2009	Naspers LTD	BuscaPe.com Inc
9/29/2009	The Bidvest Group Ltd	NOWACO Czech Republic sro
10/1/2009	Allied Technologies Ltd	Kenya Data Networks Ltd
3/1/2010	Santova Logistics Ltd	Aviocean(Pty)Ltd
3/30/2010	Sycom Property Fund	Tyger Hills Office Park (Pty) Ltd
4/14/2010	Adcock Ingram Holdings Ltd	Ayrton Drug Manufacturing Ltd
4/16/2010	Nedbank Group Ltd	Imperial Bank Ltd
4/19/2010	SA Corporate Real Estate Fund	Old Mutual Triangle Warehouse
7/1/2010	Grand Parade Investments Ltd	Tatts Group Ltd-Gaming Operations
8/27/2010	Redefine Properties Ltd	Hyprop Investments Ltd
9/1/2010	Santam Ltd	Indwe Broker Holdings Group Ltd
9/8/2010	Business Connexion Group Ltd	Business Connexion (Pty)Ltd
10/7/2010	Datatec Ltd	Westcon Group Inc
11/30/2010	Imperial Holdings Ltd	CIC Holdings Ltd
1/3/2011	FirstRand Ltd	Barnard Jacobs Mellet Holdings Ltd
1/31/2011	Aspen Pharmacare Holdings Ltd	Sigma Pharmaceuticals Ltd- Pharmaceutical Division
3/1/2011	Sasol Ltd	Talisman Energy Inc-Farrell Creek Shale Gas Assets
3/18/2011	Steinhoff International Holdings Ltd	Conforama SA

3/28/2011	Capital Property Fund Ltd	Pangbourne Properties Ltd
5/13/2011	Hospitality Property Fund Ltd	Arabella South Africa Holdings (Pty)Ltd-Hotels(2)
5/31/2011	Tiger Brands Ltd	Davita Trading (Pty)Ltd
6/9/2011	Resilient Property Income Fund Ltd	The Grove, Pretoria
6/22/2011	Gold Fields Ltd	Gold Fields Ltd-Tarkwa & Damang Gold Mines
9/1/2011	Hyprop Investments Ltd	Attfund Retail Ltd
9/30/2011	AngloGold Ashanti Ltd	First Uranium Corp
1/6/2012	Keaton Energy Holdings Ltd	Leeuw Mining & Exploration (Pty) Ltd
3/1/2012	AVI Ltd	Green Cross Manufacturers (Pty)Ltd
3/12/2012	Rainbow Chicken Ltd	Bush Valley Chickens
3/14/2012	Sun International Ltd	Real Africa Holdings Ltd
3/15/2012	Afrimat Ltd	Clinker Supplies (Pty)Ltd
6/13/2012	Hudaco Industries Ltd	Keys Makin Plastics (Pty)Ltd, Quality Compounding(Pty)Ltd
6/27/2012	AECI Ltd	General Electric Co-Chemical & Monitoring Solutiions Business
7/25/2012	Pretoria Portland Cement Co Ltd	Habesha Cement Share Co
8/8/2012	PBT Group Ltd	Prescient Capital (Pty)Ltd
10/1/2012	Mondi Ltd	Nordenia International AG
10/2/2012	Sanlam Ltd	Shriram Capital Ltd
12/4/2012	Consolidated Infrastructure Group Ltd	AES Angola Environmental Servicos Lda
1/24/2013	Netcare Ltd	General Healthcare Group PLC
1/25/2013	Adcorp Holdings Ltd	Paxus Australia Pty Ltd
4/12/2013	Distell Group Ltd	Burn Stewart Distillers Ltd
4/26/2013	Raubex Group Ltd	Tosas Holdings (Pty)Ltd
6/30/2013	ARB Holdings Ltd	Eurolux (Pty) Ltd
7/1/2013	Delta Property Fund Ltd	Atterbury Parkdev Consortium (Pty)Ltd
7/2/2013	The Bidvest Group Ltd	Amalgamated Appliance Holdings Ltd {AMAP}
12/11/2013	Murray & Roberts Holdings Ltd	Clough Ltd
2/28/2014	Naspers LTD	Neralona Investments Ltd
3/1/2014	Growthpoint Properties Ltd	Tiber Property Group (Pty)Ltd
4/30/2014	Vodacom Group Ltd	Vodacom Tanzania Ltd
5/1/2014	Tsogo Sun Holdings Ltd	Redefine BDL Hotel Group Ltd
5/21/2014	Steinhoff International Holdings Ltd	JD Group Ltd
6/12/2014	Nedbank Group Ltd	Banco Unico SA
8/1/2014	Woolworths Holdings Ltd	David Jones Ltd
8/5/2014	Liberty Holdings Ltd	Liberty Health Holdings Pty Ltd
8/31/2014	Redefine Properties Ltd	Annuity Properties Ltd
9/1/2014	Octodec Investments Ltd	Premium Properties Ltd
9/1/2014	Resilient Property Income Fund Ltd	Jubilee Mall

9/30/2014	Afrocentric Investment Corp Ltd	Pharmacy Direct (Pty) Ltd,Curasana (Pty) Ltd
11/5/2014	Vukile Property Fund Ltd	Synergy Income Fund Ltd
11/10/2014	Discovery Ltd	Prudential Health Ltd

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